DOCUMENT RESUME

ED 087 863 CE 000 951

TITLE	Technical Education: Careers Unlimited. Proceedings of The National Clinic on Technical Education (9th, Fort Worth, Texas, March 15-17, 1972).
INSTITUTION	American Technical Education Association, Inc., Delmar, N.Y.
SPONS AGENCY	Bureau of Adult, Vocational, and Technical Education (DHEW/OE), Washington, D.C.
PUB DATE	Mar 72
NOTE	255p.
EDRS PRICE	MF-$0.75 HC-$12.60
DESCRIPTORS	Accreditation (Institutions); *Career Education; *Conferences; Disadvantaged Youth; Environmental Technicians; Federal Legislation; Health Occupations Education; Instructional Materials; Law Enforcement; Post Secondary Education; Professional Training; School Community Relationship; School Industry Relationship; Secondary Education; *Speeches; *Technical Education; Vocational Directors; *Vocational Education

ABSTRACT

The Proceedings, attended by more than 400 technical educators from 42 States and two foreign countries, reflected various topics and information relative to the Clinic's theme. The speeches should assist technical educators and administrators at all post-secondary levels in the preparation of future manpower needs in technical education. The titles of the speeches were: Technical Education--Careers Unlimited (Robert M. Worthington), Articulating Career Programs--Secondary/Post-Secondary (Theodore A. Kosehler), Articulating Career Programs--School/Community (Jimmie C. Styles), Articulating Career Programs--Health Agencies/School (Roger Smith), Professional Development for Technical Education Personnel (Jerry Dobrovolny), New Materials for Technical Teachers (Maurice Roney), Technical Education for the Disadvantaged (Reby Cary), Administration of Dental Programs at the Post-Secondary Level (Thomas A. McDermott), Law Enforcement Programs (Denny Pace), Technicians for Environmental Control (Walter Brooking), Industry Speaks Out (John L. Cockrell), Accountability in Technical Education (Edwin L. Kurth), Accreditation and Technical Education (Barry L. Mellinger), and Development of Human Potential--A National Responsibility (Jim Wright). The appendix provides the minutes of the Association's business meeting, the program, and related information. (AG)

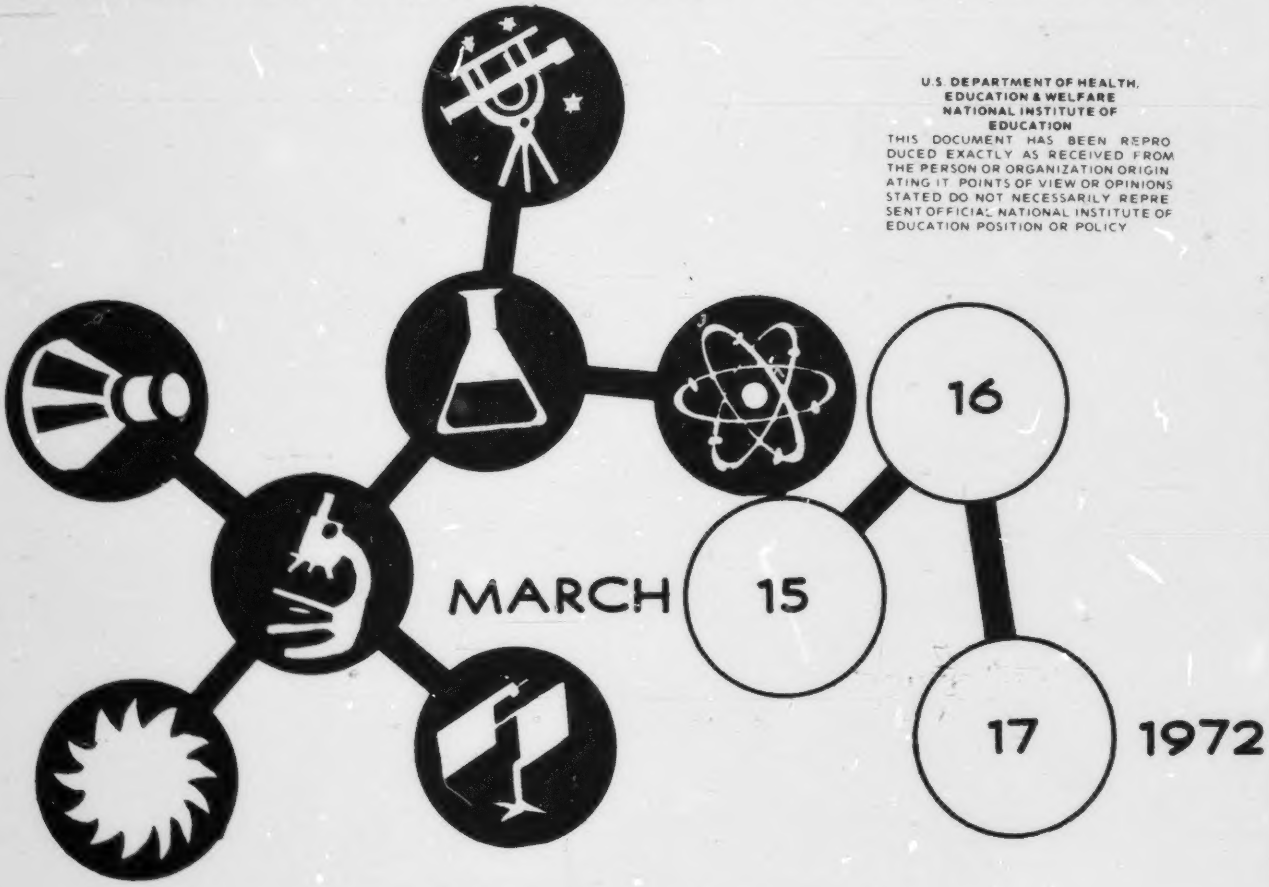
ED 087863

PROCEEDINGS...

NATIONAL CLINIC ON TECHNICAL EDUCATION

SPONSORED BY
AMERICAN TECHNICAL EDUCATION ASSOCIATION
AND
UNITED STATES OFFICE OF EDUCATION

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY



MARCH 15 16 17 1972

SHERATON HOTEL
FORT WORTH TEXAS

HOSTED BY
SOUTHWESTERN REGION AMERICAN TECHNICAL EDUCATION ASSOCIATION
— TARRANT COUNTY JUNIOR COLLEGE —

CE 000 951

ED 087863

Proceedings of The

NATIONAL CLINIC ON TECHNICAL EDUCATION

Sponsored by

United States Office of Education

and

American Technical Education Association

TECHNICAL EDUCATION
CAREERS UNLIMITED

Program Co-Chairmen

Dr. Walter J. Brooking
Division of Vocational and
Technical Education
U. S. Office of Education
Washington, D. C.

Mr. Jimmie C. Styles
Vice Chancellor for Research
and Development
Tarrant County Junior College
Fort Worth, Texas

PREFACE

The 1972 Ninth Annual National Clinic on Technical Education, sponsored by the American Technical Education Association and the United States Office of Education was held in Fort Worth, Texas. Over 400 technical educators from 42 states and two foreign countries participated.

One highlight of the Clinic was the honoring of the past presidents of the American Technical Education Association. Of the twenty-four still living, twelve were present, recognized and honored at the closing banquet.

These Proceedings reflected various topics and information relative to the theme of the Clinic "Technical Education - Careers Unlimited." The topics presented dealt with articulating career programs within secondary, post-secondary, junior college and health agencies; professional development for technical education personnel; new materials for technical teachers; technical education for the disadvantaged; administration of dental programs; accountability and accreditation in technical education; law enforcement programs; and technicians for environmental control.

The speeches contained in this document should serve a useful purpose to technical educators and administrators at all post-secondary levels in the preparation of future manpower needs in technical education.

The American Technical Education Association is indebted to the United States Office of Education for co-sponsoring this annual education conference. The sponsors are also grateful to the administration and staff of the host institution, Tarrant County Junior College District, who were responsible for the local arrangements and the success of this Clinic and also to those who participated in the program for their scholarly contributions. The exhibitors who participated in the conference also made significant contributions to the success of this Clinic. The sponsors further wish to acknowledge Texas State Technical Institute for printing this professional document.

George Mehallis

George Mehallis, President
American Technical Education Association

March, 1972

TABLE OF CONTENTS

Page

TECHNICAL EDUCATION - CAREERS UNLIMITED - Robert M. Worthington 1

ARTICULATING CAREER PROGRAMS - SECONDARY/POST-SECONDARY - Theodore A. Koschler 24

ARTICULATING CAREER PROGRAMS - SCHOOL/COMMUNITY - Jimmie C. Styles 32

ARTICULATING CAREER PROGRAMS - HEALTH AGENCIES/SCHOOL - Roger Smith 43

PROFESSIONAL DEVELOPMENT FOR TECHNICAL EDUCATION PERSONNEL - Jerry Dobrovolny 56

NEW MATERIALS FOR TECHNICAL TEACHERS - Maurice Roney 73

TECHNICAL EDUCATION FOR THE DISADVANTAGED - Reby Cary 80

ADMINISTRATION OF DENTAL PROGRAMS AT THE POST-SECONDARY LEVEL - Thomas A. McDermott 88

LAW ENFORCEMENT PROGRAMS - Denny Pace 109

TECHNICIANS FOR ENVIRONMENTAL CONTROL - Walter Brooking . . . 116

INDUSTRY SPEAKS OUT - John L. Cockrell 142

ACCOUNTABILITY IN TECHNICAL EDUCATION - Edwin L. Kurth 159

ACCREDITATION AND TECHNICAL EDUCATION - Barry L. Mellinger . . 172

DEVELOPMENT OF HUMAN POTENTIAL - A NATIONAL RESPONSIBILITY - Jim Wright 189

APPENDICES 198

APPENDIX A - Minutes of ATEA Business Meeting 199

APPENDIX B - The Program 205

APPENDIX C - Planning Committee 212

Page

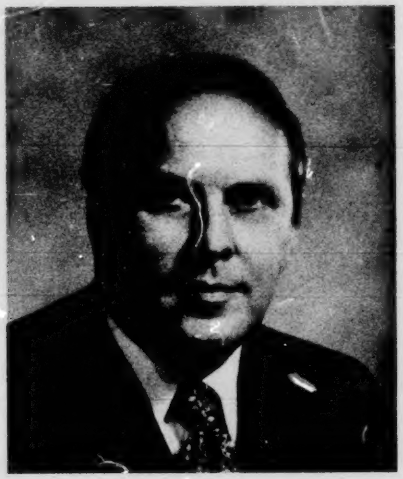
APPENDIX D - Attendance by State 214

APPENDIX E - Exhibitors 215

APPENDIX F - Conferees 218

APPENDIX G - Past Presidents of ATEA 249

TECHNICAL EDUCATION - CAREERS
UNLIMITED



ROBERT M. WORTHINGTON
Associate Commissioner, Adult,
Vocational and Technical Education
U.S. Office of Education

The evidence of rapid technological change and its effects on the lives of the people of this Nation is everywhere about us. The realization of its importance is made sharply evident by the very fact of this Ninth Annual National Technical Education Clinic at which are assembled Federal, State, and local Education leaders whose responsibility it is to provide programs of Technical Education designed to cope with a technological society.

We in the Office of Education especially welcome the co-sponsorship and shared professional leadership of the American Technical Education Association at this conference. It is by such cooperative efforts in educational leadership functions that the technical information, the professional exchange and the necessary bridging from the past to the present and into the future in the development and achievement of major educational objectives may be best served. We are proud to be a part of it!

It is becoming increasingly clear that the largest increase in job opportunities in the Nation's workforce is now and will continue to be for persons who have earned less than a baccalaureate degree but who have the specialized skills and knowledge to support the professionals in the Nation's work and to guide the efforts of the skilled and semi-skilled persons at the technical and specialists level in all major fields of work. The education and work experience required to prepare such specialized supportive people must be based not only on high school preparation but also on technical education beyond the high school.

The tremendous variety of these supportive jobs and the rapidly growing opportunities for qualified persons lends meaning and urgency to the theme of this conference, "Technical Education - Careers Unlimited." Some persons will enter Technical Education immediately after high school, but an increasing number will be entering programs at various stages in their career and at various ages throughout their lifetime. Indeed, it is this establishment which must be strengthened to provide many of the Nation's technicians, specialists and highly skilled technical personnel.

There is already a large establishment which serves this need. All institutions that are providing specialized non-baccalaureate educational programs beyond the high school, whether private or public, are an important part of the occupational education establishment and function within the overall concept which is now a major priority of the U.S. Office of Education.

My purpose here this morning is to describe and explain what new initiatives and developments are occurring in the U.S. Office of Education and to share with you some of the exciting challenges before us. Hopefully, we in the USOE can enlist your assistance in making the results of these initiatives a reality where it really counts, in dynamic programs preparing individual persons to perform the complex technical tasks which sustain our society.

Since most of the emphasis of technical educators usually lies beyond the high school, I should like to point out that persons in these types of technical programs are always building upon their earlier education, including their pre-school training. Specialized programs beyond high school to prepare the skilled technical manpower necessary for our society is a part of a continuum of learning experiences which started when the students entered school, or before.

With that in mind, let us look at the career education concept as it relates generally to all levels of education and particularly as it relates to programs beyond high school.

Education in a technological society must teach its people to perform the work and provide the services required to maintain and further develop the society. It must also prepare its people to cope with the rapid changes which new technology causes in their personal lives, such as occupational obsolescence, social mobility, world wide instant communication and social awareness, changing political emphasis, governmental service delivery systems, environmental awareness, and many other subtle but significant social and psychological changes.

For the past year career education has been a major objective of the Office of Education. No Office of Education initiative has attracted more attention nor received more support!

Career Education actually relates to all educational experiences from early childhood throughout the productive life of the individual. In early childhood it provides an awareness of the world of work, and some direct, hands-on experience to motivate and captivate the learner's interest.

At the end of high school, the burden is on the school system to give strong, positive assistance to the students in obtaining job placement, or placement in a post-secondary institution, whichever the student chooses. Thus, a strong accountability factor is built into career education.

The development of a career education system requires the accomplishment of differing objectives at each level of the existing school system. For example, in kindergarten through the sixth grade, the objectives are to develop in each pupil self-awareness and positive attitudes about the personal and social significance of work. Students in these grades receive a meaningful overview of the world of work by being exposed to job clusters. The USOE has developed fifteen major clusters that encompass the 20,000 different job categories listed in the Dictionary of Occupational Titles.

In the seventh and eighth grades, students devote more attention to the occupational clusters of their choice, leading to an in-depth exploration at the ninth grade. Subject matter also is more meaningful and relevant because it is unified and focused around a career theme.

In grades nine and ten, the student gets in-depth exploration and training in an occupational area, and is provided a foundation for further progress. This leaves open the option to move between clusters.

In grades eleven and twelve, the student receives intensive preparation in a selected cluster, or in a specific occupation, in preparation for job-entry or further education. His studies are related more closely to the world of work. Guidance and counseling are more concentrated. The school is obligated to assist the student in obtaining a job, entry into a post-secondary occupational education program, or entry into a four-year college program.

Career education in our technological society is designed to provide new dimensions to the education of all Americans.

These are some its most urgent objectives:

- ☆ It aims to lead all persons to respect the dignity of work well done, and to hold in high regard those who do it.
- ☆ It aims to acquaint all of our youth with a knowledge of all the differnet kinds of work which must be done in our complex technological society and to kindle in each the desire to master some exciting job which needs to be done, one which uses a full measure of his abilities and which will make him self-supporting and self-respecting.

- * It aims to reduce the disgraceful failure and attrition rates in our high schools and colleges, often caused by ill-advised or unrealistic career choices or inadequate scholastic preparation.
- * It aims to insure all against the debilitating and eroding effects of enforced unemployment. Constantly available options to continue career education at any stage or age in a career will open the way if we but provide the educational opportunities.
- * It aims to enable more people of all ages to spend more time in organized study whenever they need it to keep up with changes in this society's complex technological work.

[illegible] how these aims may be accomplished:

[illegible] EVERYONE

Career education, as the concept is now evolving under the leadership of Dr. Sidney P. Marland, U.S. Commissioner of Education, will begin as early as kindergarten, revised curriculums will relate reading, writing and arithmetic to the varied ways in which adults earn a living. The careers have been grouped by the Office of Education into families or "clusters" of occupations, as follows:

AGRI-BUSINESS

BUSINESS AND OFFICE

HEALTH

PUBLIC SERVICE

ENVIRONMENT

COMMUNICATIONS & MEDIA

HOSPITALITY & RECREATION

FINE ARTS & HUMANITIES

MANUFACTURING

MARKETING & DISTRIBUTION

MARINE SCIENCE

PERSONAL SERVICES

CONSTRUCTION

TRANSPORTATION

CONSUMER & HOMEMAKING EDUCATION

The elementary occupational awareness and the prevocational and exploratory education starting in the middle and junior high schools are aimed at providing an occupational literacy and familiarity with the world or work. This helps to inform the student about the variety of challenging and interesting work in the modern world and society's need to get it done. It also builds respect for those who do it.

The concept relates to the subjects taught by all teachers so that real career-centered learning will be used to provide an interesting emphasis and heighten student interest and motivation whether the class deals with history, language, general science, health, social science, or whatever.

As each youngster advances into junior high school, he will select various clusters or broad groupings of related occupations and begin exploring the nature of specific careers in each one. By senior high school, he will concentrate on the group of career opportunities which interests him most and will develop sufficient entry level skills in a specific occupation to qualify for a job.

It is visualized that students will have an opportunity to enjoy actual work experience during their high school years through cooperative arrangements with employers. Yet each student's program will remain flexible enough to enable him to switch to a related occupation later with a minimum of supplementary training. In addition, each student in a career education program will keep his options open.

It is expected that the career education cluster approach will provide better educated youth to enter either professional preparation in a four-year college or the post-high school programs which educate technicians or similarly specialized personnel.

CAREER EDUCATION MUST START WITH CHILDREN

Until half a century ago, before the impact of applied modern technology began to displace muscle power with machinery, children had contact with the world of work which permitted them to comprehend and understand most of the common occupations and to respect the persons who performed the work of the society.

In recent years however, children have been isolated from the world of work. Farm and home chores have almost disappeared, and even the work within the home has been changed to such a degree that there is little meaningful contact between a modern child and those who do the work and supply the services in today's complex society. Working parents and members of the family leave home to work, perform their duties, and return. Their children are seldom able to obtain any meaningful understanding of what they do because they have little opportunity to observe and to interpret the tasks performed, or the satisfactions, disciplines and rewards of work.

Career Education programs give great promise of reopening the world of work to children as an interesting, exciting, challenging and fascinating area of activities and adventures. It is an excellent means of motivating children to learn about reading, mathematics, science, etc. while simultaneously learning about the necessity for and the dignity and satisfaction of work well done.

CAREER EDUCATION BEYOND THE HIGH SCHOOL

Career education beyond the high school includes preparation required by an individual to enter employment, improvement of his knowledge or skills as they relate to his job, or preparation for a new one. It also includes the cultural and recreational knowledge necessary to cope with living in the post industrial society. Man cannot live by bread alone!

Career education, in the context and the relationship of preparation for the work today and in the future, has little relationship to past practice. The accumulated results of applied science and technology have radically changed the world of work during the last half of the twentieth century to require a more demanding educational preparation where the specialization needed must in large measure be learned by adults after high school.

Machines have taken the place of the unskilled worker in our mines, forests, factories, and on our farms and are rapidly displacing the unskilled in offices, transportation systems, and slightly skilled work by which a large proportion of the population of this and other Nations supported themselves and their families has largely been swept away by mechanization. Most work of the past could be learned by working beside an experienced worker and observing and learning those elements of the work which comprised most of his employment activities on the job. A person needed only to bring to the job a limited amount of basic educational preparation. In recent years, our Nation has aspired to a level of general literacy in which nearly all people are able to read and write and exercise a functional literacy regarding arithmetic, social understandings, and the tools which basic education provides as a basis for learning to live and to earn a living in our society.

With the unskilled worker displaced to a great extent, we as a Nation are confronted with a unique educational problem never before experienced to the same degree by any society. Our social heritage and mores have been built on the concept that most of our population must work to support themselves and to lead satisfying and fulfilling lives. A person without a job and without the preparation to get one does not enjoy a very favorable status in most of this society. Without a job he cannot support himself and can neither respect himself nor others, nor the society in which he lives.

There is no alternative to providing a better education for our population because the technological world in which we now live will become more complicated rather than less complicated in the future.

It is precisely because of the seriousness of the educational problem which our Nation currently faces that Commissioner Marland and all of us in the Office of Education are placing so much emphasis on the concept of career education. Our educational system has assumed that all our youth must be prepared to earn a baccalaureate degree when in fact fewer than twenty percent have in the past graduated with baccalaureate degrees into professional and managerial jobs. Further, the Bureau of Labor Statistics predicts that in the foreseeable future, 83 percent of the Nation's work will not require a bachelor's degree preparation. Fewer than 30 percent of our students now receive vocational preparation which will enable them to get a job when they leave high school and over 50 percent of our youth receive an education which neither prepares them to enter further education beyond high school with reasonable assurance of success nor to become employed. It is this short fall in our educational system which we believe needs to be changed and which can be changed by implementing the concept of career education. Career education, as we conceive it would guarantee that all students, when they leave high school, will be prepared either to take a job or to enter the next step of educational preparation for their chosen work.

KINDS OF WORKERS PREPARED IN POST-HIGH SCHOOL EDUCATION

Almost all professionals, most technicians and similar supportive specialists, and many skilled workers will continue into programs beyond high school before they enter the work force. Almost all of these workers will return to institutions beyond the high school for formal upgrading, updating, or additional preparation for their careers in order to cope with changes in technology which affect their chosen occupations.

TECHNICIANS AND SIMILARLY SPECIALIZED SUPPORTIVE PERSONNEL

As stated at the outset, technicians and similarly specialized supportive persons are the most needed personnel in today's world of work.

Their education requires a comprehension of the basic principles and technological knowledge of the professional whose efforts they support. In addition, they frequently learn managerial and administrative skills which permit them to direct the efforts of the skilled and semi-skilled workers whose efforts are required to accomplish the tasks in their field. Usually, however, administrative skills are learned after the person is employed.

Technicians require less than a baccalaureate education to start their careers as supportive personnel. They usually require from one to three years of organized study beyond high school before starting to work in the field. Because they perform tasks and services which involve very important responsibilities, their preparation will permit no compromise with ignorance.

ADULT EDUCATION BEYOND THE HIGH SCHOOL (A Great Challenge)

A major career education emphasis beyond the high school must be to provide opportunity and encouragement to more adults. For example, it will help them upgrade their skills and knowledge on their present jobs, learn new skills and knowledge to change or advance their careers, retrain for new jobs when their present jobs have been eliminated by organizational or technological changes, and provide saleable skills to those who have never been in the work force.

Career education also provides specialized educational services for: women who have already raised families or who must supplement family income or provide all of it; older workers at all levels displaced by younger, better-prepared workers; retired military or other persons who want to enter another field of employment; and scientists, managers, and other professional leaders who have been displaced by such national technological goal changes as aerospace environmental improvement.

The increasing necessity for our nation to provide educational opportunities for those who have left school and are unemployed, or those who are underemployed, is becoming increasingly evident. Clearly these persons, many of whom are mature, able, and talented but are perhaps handicapped by academic, socioeconomic, or other circumstances, represent a valuable pool of human resources which must be developed. This is a major challenge to our post-secondary technical education programs.

There are thousands of individuals who are unable to obtain employment because of lack of educational preparation. They have outgrown the high school and will not return to the institution which failed them. The responsibility for providing a means for these individuals to reenter organized educational programs to start where their previous educational preparation left off and to equip them to do work by which they can support themselves with dignity and self-respect becomes a responsibility of the educational institutions beyond high school. This is an essential part of career education in junior colleges, technical institutes, area vocational schools, division of four-year colleges, both private and public, and proprietary business and technical schools.

More programs to serve these underprepared persons are needed. We know how to organize such programs, and we as educational leaders must provide these services to all who need them. Herb Striner has pointed out that gross national product growth depends on Adult Occupational Education!

Today, as in the past, many of the Nation's youth and adults participate in organized, post-secondary educational programs in technical institutes, junior and community colleges, branches of four-year colleges, and universitites, business colleges, and a wide variety of public or private specialized schools where they prepare to enter jobs as widely divergent as heavy construction equipment operation and training to be artists' models. The range of these programs is as broad as the applied technologies, related arts, health, environmental science and conservation, social sciences, physical sciences, biological sciences, and horticulture.

PUBLIC JUNIOR COLLEGES, TECHNICAL INSTITUTES AND AREA VOCATIONAL TECHNICAL SCHOOLS

The fastest growing segments of the post-secondary, non-bacclaureate career educational establishment are the junior and community colleges, public technical institutes, and area vocational and technical schools. These schools receive most of the Federal, State and local financial support for occupational education below the baccalaureate level. They have the advantage of being able to respond to the needs of the geographic areas which support them.

The involvement of four-year colleges and universitites in post-high school non-baccalaureate career education appears to be growing in response to national needs.

A study, "Technical Education: Less Than Baccalaureate Level Programs in Higher Education," made by Eastern Kentucky University in 1971 showed that over 150 State colleges and universities, including land-grant colleges, offered technical programs. This number represented slightly more than 75 percent of all such institutions.

A recent study, "A Summary of Paraprofessional Training in Colleges and Universities, 1970-71," published by the Office of New Careers, Department of Health, Education and Welfare, Washington, D.C., indicated that 363 colleges and universities offered a total of 937 non-baccalaureate programs for paraprofessionals in the combined fields of health, education, and welfare service. This study included both public and private institutions, and was limited to health, education and welfare fields in view of the growing need for technicians and similar specialists. The same study reported that 397 junior colleges offered a total of 1,384 programs in the same fields.

Both studies show that four-year colleges and universities are an important part of the non-baccalaureate post-secondary career education establishment, and perhaps these institutions should become significantly more involved. With their residential (dormitory) capabilities and established faculties and facilities in engineering, health, agricultural, oceanographic, earth, and social sciences, they have a unique capability to provide programs for very specialized kinds of technicians in fields where enrollment must be drawn from a State or region where only one program may be needed or justified to prepare the necessary specialized workers.

PRIVATE SCHOOLS AND COLLEGES: THEIR IMPORTANCE

Private educational institutions for occupational education beyond the high school comprise a very important part of post-secondary education. There are more private technical institutes, colleges, business schools and specialized trade and technical schools than public institutions which offer less than baccalaureate occupational education programs. The U.S. Office of Education lists about 7,500 accredited institutions under the federally supported student loan programs. Of this number there are about 2,500 public junior colleges, technical institutes, four-year colleges and universities and area vocational schools which offer technical education programs.

In addition to the accredited private institutions there is evidence that there are probably as many as 10,000 private schools offering specialized occupational programs. Many do not seek accreditation for purposes of student loans but are nonetheless long-established institutions rendering an effective specialized education service. The private post-secondary institutions probably enroll about as many students beyond the high school as do the public ones, but they usually graduate and place a larger proportion of their students. (This does not include home study correspondence schools.)

Much can be learned from them because their programs must be excellent or the institution will go bankrupt. They listen attentively to employers and teach what students need to know rather than what someone thinks is good for them. The instructors teach as if their jobs depend upon successful graduates because they do.

The Bureau of Adult, Vocational and Technical Education in the Office of Education maintains constant liaison with the organizations which accredit and represent private institutions. And Congress, through the Manpower Development and Training legislation, the Vocational Education Act of 1963 as Amended in 1968 and in other important legislation, has emphasized the need for the public and the private sectors to complement one another to provide the necessary educational programs for occupational education beyond the high school.

EMPLOYERS OF ALL KINDS, BOTH PRIVATE AND PUBLIC

A great deal of the career education beyond high school is obtained on-the-job but enhanced and completed by part-time attendance of informalized classroom laboratory or clinical educational programs. Examples are clinical programs for nurses, preparation of law enforcement officers, and cooperative education programs for technicians of all kinds. Apprenticeship programs for specialized craftsmen and service workers whose work involves the application of more complicated and interrelated technologies, particularly those spanning more than one major field of knowledge such as electrical and mechanical maintenance, are other examples.

Formal classroom or laboratory education combined with work on jobs will become increasingly necessary to prepare biomedical equipment technicians, electro-mechanical technicians, and marine life and oceanographic technicians. They must understand both the biological and physical sciences underlying their disciplines to meet their responsibilities as technical supportive personnel.

Private industrial employers, the military, and all other employing agencies, both private and public, also have their part to play in post-secondary career education.

The contribution of employers of all sorts to specialized occupational education by providing on-the-job training and work experience will become even more important in the future. The advantages of cooperative education programs or comparable internships have been recognized since the preparation for scientific careers began. The internship served by medical doctors to learn how to heal by healing is little different except in degree from the many specialized work experiences required by modern technical workers in most fields. The reality of on-the-job training provides experiences which cannot be simulated in a school situation and permits the learner to gain some degree of self-support, to gain respect for himself and for the experienced masters of the work, and to learn the practices of the system within which he will work. More cooperative programs will be needed to prepare people for the very specialized kinds of work that cannot practically be simulated in a laboratory.

RECENT USOE DEVELOPMENT IN POST-SECONDARY EDUCATION

As further evidence of the USOE commitment to career education, Commissioner Marland appointed a USOE task force under the chairmanship of the Executive Deputy Commissioner, Peter Muirhead, with representatives in working subcommittees from all major bureaus and offices of the Office of Education. In addition, he recently convened a panel of 24 scholars who are broadly representative of the academic community to examine the career education concept from their viewpoint and to constructively criticize the program as it develops and progresses.

Two months ago I had the pleasure of speaking before the National Conference of State Junior and Community College Directors in Columbus, Ohio on post-secondary career education. I invited their assistance, their criticism, their support and participation in the development and implementation of career education beyond the high school. At that time I also invited a number of the members of the junior colleges directors' organization to form a liaison committee with the Office of Education, Bureau of Adult, Vocational and Technical Education. It held its first meeting February 3, 1972. In addition to State Community College Leaders, representatives of the American Vocational Association and the American Association of Junior Colleges were present. The Liaison committee will provide a means for continuing dialogue and cooperative efforts between the Bureau of Adult, Vocational and Technical Education; the State Directors of Community Colleges; the State Directors of Adult Education and others actively involved in developing and implementing career education across the nation.

The State Directors of Adult Education convened in a meeting in December to discuss career education as it relates to the Bureau of Adult, Vocational and Technical Educational Education in the U.S. Office of Education and to the programs being administered in the States through that office.

"The 25 Technical Careers" National Campaign by the Advertising Council which was first announced at the National Technical Education Clinic held in St. Louis in 1968. It was promoted and sponsored by the National Industrial Conference Board with the cooperation of the U.S. Office of Education and has been extended through December 31, 1972. The extended campaign is now supported by both the National Industrial Conference Board and the National Manpower Foundation with the cooperation of the U.S. Office of Education. The State Directors of Vocational Education have also been deeply involved since letters requesting brochures are referred to them. Many States have produced excellent directories and have greatly increased their capacity to inform their citizens about programs in their States. This national advertising program is supported by employers throughout the country in a mutual endeavor to find a way to meet the growing need for more technicians and specialized supportive personnel.

Since the campaign began in mid-1968 it has attracted considerable nationwide interest. More than 1,200,000 people have requested the "25 Technical Careers You Can Learn in 2 Years Or Less" booklet, and many have written follow-up letters to the Office of Education asking for further information. In addition, a heavy volume of correspondence has been received requesting information about technical career education, and advocating initiation or strengthening of technical education programs. This mail has been addressed to the President, the Secretary of Health, Education and Welfare, Member of Congress, and the U.S. Commissioner of Education.

Since the campaign began there have been significant enrollment increases. In FY-1970 there were over 420,000 or 78 percent more students enrolled in public post-secondary education programs than in FY-1968. Incomplete reports indicate that enrollments in private technical schools increased during that period also. Perhaps even more significant is the increase in expenditures by Federal, State and local governments for post-secondary occupational educational from $252,826,000 in 1969 to $454,142,000 in 1970. This represents nearly an 80 percent increase. We believe that the continuation of the advertising campaign will continue to help strengthen occupational education programs beyond high school.

There is also continuing support for technical career education curriculum development. The major research, development and pilot programs in four technical areas: electro-mechanical, biomedical equipment, electro-optical, and nuclear medical under contract with the Technical Education Research Centers at Cambridge, Massachusetts, continue to be supported. You will hear more about them later this week in the session devoted to teacher education.

Two-year post-high school curricula are also being developed under contracts for Library Technicians, Educational Media Technicians, Veterinary and Meat Inspection Technicians, Air Pollution Technicians, and Police Science Technicians. A contract for a special guide entitled "Administrative Factors and Actions in Initiating Post-High School Environmental Programs, A Suggested Guide," is nearly complete and should help in this important area of post-secondary career education. The Bureau has also provided advice and encouragement to the National Fluid Power Foundation which has prepared a Fluid Power Technology curriculum guide.

Career education contractors are now developing materials K through 14 in the cluster areas of Agribusiness and National Resources, Transportation, Textile, Apparel and Accessories Industry, Recreation, Hospitality and Tourism, Public Service, Health, Manufacturing, Child Care and Development, and several others. These important materials should strengthen the preparation and interests of elementary and high school students in post-secondary, non-baccalaureate career programs in years to come.

Much needs to be done though before the concept of career education becomes a fully developed system. Much has been done already in terms of developing working models, in building cooperative programs with employers of all kinds, and in cooperating with employee organizations and organized labor. But much more has to be accomplished!

The concept of career education seems well underway, but as Commissioner Marland says, "it must be built by the efforts of everyone, in his own way, if it ever is to achieve its aims." And if by such cumulative development, it does fulfill its evident promise it will be of inestimable value both to the individuals involved and to our complicated technological society.

One inescapable aspect of that promise is the tremendous growth in the number and variety of post-secondary career education programs and services to fulfill the inevitable need for technical education. For technology is an area in which careers are in fact unlimited!

ARTICULATING CAREER PROGRAMS - SECONDARY/POST-SECONDARY

THEODORE A. KOSCHLER
Vice President, Occupational Education
Miami-Dade Junior College

With the national emphasis on career education, it is appropriate that technical educators evaluate the effectiveness of current and proposed programs and the manner in which the programs are being presented. State legislatures, local boards of trustees, boards of education, and the public in general no longer appear willing to accept what has been assumed to be an adequate effort to develop manpower. Untrained youth presents communities with unacceptable problems concerning employment, social behavior and supervision.

The answer to most unemployment and social dilemma situations is found in vocational-technical education. Alan Pifer of The Carnegie Corporation reported in the February issue of TIME Magazine that it costs $4,000 a year to keep a student in college, $7,500 a year to support a person in the military, approximately $7,800 in VISTA and $10,000 in the Peace Corps. The statement that "Education Pays and Does Not

Cost" can be well documented. However, financing education becomes increasingly more difficult and technical educators must demonstrate that the best vocational-technical program is provided at the local district level for all students.

The American Vocational Association's 1972 Program of work includes an emphasis on working with others. Post-secondary institutions must work more effectively with secondary schools if the student's interest is to be served. If the student's occupational needs become the focal point of institutional responsibility, secondary school personnel and post-secondary institutional personnel need to work together in meeting these needs. Too often empire building action by institutions tends to ignore the importance of educational institutions at all levels working to provide students with a continuous program of occupational preparation. Students should be able to exit from any school program without penalty and reenter the process without encountering barriers that restrict a student's right to continue his education.

Our system of evaluation of student progress is a punitive system that should not be imposed on youth. It is important to record the progress and skills that are developed in an objective manner. Such a record may be used by the student, counselor or instructor to determine student readiness for advancement, or in the case of a student reentering a school, the starting point for skill development can be determined. Present letter grades without a record of achievement based on performance objectives are of little value. A failing grade frequently may keep a student from reentering a school or post-secondary institution. The student who is so discouraged may be the one who is most in need of additional vocational-technical training. Getting rid of students with skill deficiencies is not a satisfactory way to educate them. Some educational institutions may dismiss students in this manner; however, occupational educators cannot afford to embrace this dismissal procedure and our society should not tolerate schools or post-secondary institutions who demonstrate such a lack of regard for the occupational needs of our youth.

One effective way to insure joint planning and problem solving is to appoint a coordinating council of program directors or supervisors from both the post-secondary institution and for the secondary school system. This council should not normally have as members the superintendent of schools and the president of the community college or director of area vocational-technical school, but should represent those immediately in charge of program development and operation in the institution. Some states such as Florida have coordination councils required by action of the Legislature. Much is said and written about the necessity of all institutions cooperating to present occupational training programs to provide trained manpower; however, very little is really done in most instances. When does a post-secondary institution take a request for training to the secondary school personnel and close out a program offering? It may be possible that some training programs would serve more students at the secondary level and be more effective.

Another procedure to consider is the development of a joint program planning guide for vocational-technical education prepared by both the secondary schools and post-secondary institutions in a given community or district. This guide should contain sections on the manpower requirements, occupational training facilities, present operating programs, advisory and community assistance groups, research data available and such other items as necessary to demonstrate evidence of joint planning. If public confidence is to be retained, or in some instances restored, better decisions must be provided by educators in order to meet the need for occupational training or legislators will make the decisions often without the benefit of accurate or adequate information.

If vocational-technical education is to be offered to students at the post-secondary level much must be done by the post-secondary personnel to assist the secondary school guidance and counseling staff. A recent study conducted by the Center for Vocational and Technical Education at the Ohio State University on Community Junior College Students Enrolled in Occupational Programs, Research and Development, Series No. 53, indicates that "personnel in high schools from which community college students graduated had relatively little impact upon their career decisions." Reasons given included a lack of coordination and cooperation among school personnel, limited services and lack of occupational information. If improvement is to be expected, guidance, counseling and program personnel must work together to help students. The guidance and counseling staff must know much more about occupations and the world of work.

The 1970 report of The Carnegie Commission on Higher Education states that "it is important for all students to recognize that, whether they choose a transfer, general education, or occupational program, the ultimate objective is preparation for an occupation....

"The Commission recommends that all community colleges should provide adequate resources for effective guidance....The Commission also recommends that all community college districts provide for effective coordination of their guidance services with those of local high schools and for coordination of both counseling and placement services with those of the public employment offices and other appropriate agencies."

Present personnel working at secondary and post-secondary levels may improve the educational opportunities for students by developing a close working relationship on a continuing basis. Improvement will include consideration of the following items by all levels of education providing occupational training.

1. Work accomplished at the high school level should be accepted at the post-secondary level for its actual value. There can be no valid reason for an institution to make a student repeat a course when he has mastered the content.
2. Manpower survey should be used to determine labor requirements and the same data used at both school levels.
3. Local school and community college districts need to unite in presenting funding requirements to legislatures based on a joint capacity to develop programs to meet manpower requirements.

4. All modern instructional strategies and techniques should be employed.
5. Accreditation procedures are most helpful in improving the quality of programs and should be actively supported by all administrative and instructional personnel.
6. Post-secondary guidance personnel need to work closely and continuously with high school counselors to provide adequate occupational information and materials.
7. Similar programs offered at different schools or institutions should consider joint advisory committees.
8. Lack of equipment and space does not constitute a valid reason for not responding to occupational training requests. Community resources may provide adequate facilities to start a program.
9. The time is past when we can afford to consider anything less than a clear local and state policy to promote and operate programs. Failure to do this will cause state legislatures to make the decisions that should be made by educators.
10. Early admittance into the post-secondary programs to make occupational education available is as valid for students with immediate occupational objectives as is early admittance for superior academic students who are ready for college level work.

11. Teacher education departments of universities need to plan with the cooperation of local vocational directors, deans of occupational education and occupational program teachers to develop a more realistic program for instructional improvement and teaching effectiveness.

12. School superintendents, community college presidents, area vocational-technical school directors and all occupational education instructional personnel should evaluate their programs of occupational education in the light of the recommendations and findings of the National Advisory Council on Vocational Education.

13. Occupational guidance is a most important function of a post-secondary institution and generally cannot be effective without close and constant contacts with the counselors and guidance personnel in the secondary schools. Community colleges should seriously consider moving their guidance services off the campus. These services are most needed in the community and secondary schools being served.

14. Occupational educators should consider training programs for some students that do not require the use of institutional buildings or facilities. A carefully prepared work program may enable some students to meet with success that was denied in the traditional institutional environment. Programs of this nature require extensive planning and close supervision.

SELECTED REFERENCES

Garbin, A. P. and Vaughn, Derrald. Community-Junior College Students Enrolled in Occupational Programs:Selected Characteristics, and Preceptions. Research and Development, Series No. 53. Columbus: The Center for Vocational and Technical Education, The Ohio State University, 1971.

Medser, Leland L., and Tillery, Dale. Breaking the Access Barriers. The Carnegie Commission on Higher Education. McGraw-Hill Book Company, New York, 1971.

Standard Terminology for Curriculum and Instruction in Local and State School Systems. State Educational Records and Reports Series: Handbook VI. OE-23052. U. S. Department of Health, Education and Welfare, Office of Education. Washington, D. C., 1970.

Vocation as "Calling". Report of the Task Force on Occupational Education in Post-Secondary Education of the Education Commission of the States. Denver, Colorado (December, 1971).

Lamar, Carl F. Implications for Meeting the Needs of People. American Vocational Journal. American Vocational Association, Inc. Washington, D. C., Vol. 46/No. 4/April, 1971.

ARTICULATING CAREER PROGRAMS - SCHOOL/COMMUNITY

JIMMIE C. STYLES
Vice Chancellor for Research and Development
Tarrant County Junior College

The development of plans for a relatively simple task is more complex than one might imagine. To tackle the task of developing and applying planning techniques as they pertain to articulating school/community needs for an area as dynamic as career education can become traumatic.

For years educational institutions have been accused of being theorectical rather than practical. This may be a valid accusation in many situations. From our past experiences, we are well aware that concepts promulgated in or by an educational institution are to be used as a basis for departure -- a foundation on which practical application may be established. Converting "ivory towered concepts" to down to earth factors for implementation can be accomplished by articulating the desires, needs, and objectives of a school and its community.

The burdens of today created by the trails of yesterday oft times prevent each of us from planning for tommorrow. However, we must deal with our problems and plan adequately for the development of realistic career programs that will meet the needs of the society in which we live. The importance of articulating the school and community is paramount in a society such as we have today. It is good business to plan and apply proper articulation techniques as we work and develop career education programs.

Effective program planning techniques for career education cannot be maintained unless we gain the confidence of leaders in our community. The community today is the nation. Students in career education programs should be taught the how and why of their chosen field of endeavor. They should emerge from the educative process with an understanding of how it should be done theoretically and why certain adaptations are necessary in order to make theory apply to the practical, problematic situations they will become involved with in the everyday workings of business and industry. This is where articulating school and community activities can aid in developing competent citizens.

The planning for career education should not be relegated to the educator alone. It is encumbent upon we as educators to utilize all available survey results and community leaders in the evaluation of curriculum plans. All citizens, not just educators, have a stake in the education of tommorrow's leadership.

PROGRAM DEVELOPMENT. The major purpose of many educational institutions is to serve the educational and training needs of the community by offering established academic courses for persons who wish to pursue a baccalaureate degree, career programs for those who wish to attend school a minimum length of time and prepare for immediate employment, as well as supplementary courses for those who are employed but can benefit from improved skills and new information related to their chosen profession.

Many courses are well established and are not difficult to implement. On the other hand, some courses and career programs must be carefully selected and well planned if they are to serve a need. In some instances career programs are so highly specialized that only one or two are needed to serve a state or region. The success of any career program is the performance of the graduates when they become employed. They must have skills and knowledge to apply and be able to communicate and work with people. These are ingredients that must be provided in the career education curriculum. One way to interweave these ingredients into curriculum offerings is through the assistance of a group made up of individuals who are familiar with the requirements, role and needs of career education. In many institutions there is a procedure of development to be followed.

In planning for career education at Tarrant County Junior College, Mr. Chitsey works to:

1. Determine program needs in terms of employment opportunities

and potential student interest. This is done by studying labor market data, personal interviews with potential employers, and student feedback.

2. Select an advisory committee composed of representative community agencies.
3. Determine the feasibility of developing a program with an advisory committee.
4. Perform a task analysis of the jobs to be performed.
5. Establish a sound set of objectives and job description for the program.
6. Appoint a sub-committee from the advisory committee members at large, to work with appropriate college officials in designing a curriculum to meet the objectives and job description.
7. Thoroughly study available information relative to the curriculum under development.
8. Develop the specialized courses necessary to provide the skills and information peculiar to the objectives and job description.
9. Select or design the related and supporting courses for the curriculum.
10. Add the general courses which may be necessary to meet degree requirements, if a degree is to be awarded.

11. Review program proposals with appropriate state agency representatives, the local news media, and counselors of area high schools and other colleges.

As the preceding steps are followed, there should be a concurrent consideration of available:

1. Funding sources
2. Facilities
3. Equipment
4. Staff
5. Supervision
6. Supplies
7. General operating expenses
8. Other pertinent aspects

GET THE WORD OUT. Attractive brochures are one of the more effective means of publicizing educational programs. Therefore, they should be prepared and ready for distribution when new programs and changes in existing programs are given final approval for implementation. The information must be concise, current and correct. Brochures should be revised when curricula or regulations change.

In order to provide adequate visibility, each program or major option of a program, should have a distinctly, individualized separate brochure. Introductory material of a brochure should be revised each year to reflect current employment opportunities. This should serve as an aid in communicating program opportunities and requirements to potential students.

Admissions to many institutions does not mean admission to all programs offered at that institution. This should be clearly stated in the brochures, and programs which have additional admission requirements, should have these special requirements, incorporated into the brochure. The appearance and content of a program brochure are very important. It must be appealing to students and reflect favorably on the institution.

When designing a program brochure the following should receive maximum consideration. The design should:

1. Include an appealing front cover which clearly identifies the educational institution and program of study.
2. Contain introductory material which:
    a. Identifies the role a graduate plays in our society
    b. Identifies the need for education
    c. Identifies professional opportunities
    d. Sets forth advantages to individuals upon program completion
    e. Relates job opportunities
3. Have a curriculum outline including:
    a. Suggested speciality courses
    b. Related and support courses
    c. Electives

    This outline should indicate a semester by semester program of study to be followed by the person or persons who may choose career education as a form of academic pursuit.

4. Show appropriate student expenses:
    a. Show student fees for each semester, such as:
        (1) Matriculation fee
        (2) Other fees, as follows:
            (a) Admission
            (b) Laboratory
            (c) Building use
            (d) Parking
            (e) Student activities
            (f) Housing
            (g) Books
            (h) Supplies
            (i) Other

This listing should show an accurate estimate of total cost to a student by semester and yearly.

5. Denote admission requirements:
    a. General requirements for admission to the college
    b. Special requirements for admission to specialized programs
    c. Who to contact for additional information
6. Include availability of:
    a. Scholarships
    b. Loans
    c. Who to contact for additional financial aid information
7. Procedure for application

8. Who to contact for individualized counseling
9. Listing of other specialized educational programs offered by the institution. This is and can be an important recruiting device for all educational offerings and will help in the articulation of school and community.

REACHING CAREER COUNSELORS AND PARENTS. Articulation techniques must take into consideration the reaction, and level of sophistication, of career counselors and parents. This level of sophistication is indicative of their understanding as they relate to the opportunities provided by a career education program. If they better understand the role of this program, it will be easier to communicate the need for it to the community and the student who is interested. If the counselors, parents and students do not sufficiently understand, they will become a part of the resistence group rather than participating members who can adequately defend the program and its objectives to other students. Should this occur, articulating activities will have minimum effectiveness.

In order to provide adequate communications to counselors, faculty members, parents and other educational institutions, the following items should be considered:

1. Career days at high schools and colleges
2. Copies of materials should be provided for their use
3. Career fairs involving not only students and prospective students, but members of the educational community

4. Offer college facilities for meetings, such as:
    - a. High school teachers' meetings
    - b. Meetings of the Parent Teachers Association
    - c. Service clubs
    - d. Other
5. Act as a resource for high school counselors' courses and seminars
6. Participate in the college's speakers bureau
7. Career programs coordinator should visit with the counselors in area schools and colleges
8. Encourage students to sell programs to counselors, prospective students and parents
9. Any new program must be sold to other faculty members within the institution. Efforts should be made to convince the academic faculty of the merits and need for career education

Materials that will show the development of specialized curriculum and analytical information can be most convincing if it will provide for a promotable base and offer opportunities for continued education. The faculty providing instruction and related or support courses are important to the success of a program because they become a part of the evaluating team. You will need them for:

1. Initiating the program
2. Public relations
3. Placement

4. Support [illegible]

5. Other

CHALLENGE BY EXAMINATION. It has become apparent in education that certain people through independent study and self education have attained a level at which certain courses should not be required. Particularly, in certain career education programs, there is a large number of highly qualified mid-management persons in agencies who have attained a level of self education equivalent to or exceeding that which would be offered in certain career education courses. For example: It seems somewhat ridiculous to require a thirty-year veteran in police work to take a course in Introductory Law Enforcement. This individual has lived the history and in many instances contributed to the successful, historical development of law enforcement. There should be a way by which academic recognition can be given for this experience. One way of permitting this is to let qualified individuals challenge certain courses by examination. If a person successfully challenges a particular course, he may receive credit for that course without having to attend classes. Our community will no longer tolerate the expense demanded when the ultimate objective becomes departmental or institutional perpetuation rather than service to our further leaders.

INCREASING SPECIALIZED COURSE ENROLLMENTS THROUGH COOPERATIVE ARRANGEMENTS WITH OTHER COLLEGES. Earlier in this presentation there was a discussion of procedures and techniques for program development.

There I alluded to the fact that to meet the needs of some communities concentrated efforts must be maintained to prevent costly duplication of offerings in adjacent institutions. In education today career programs are an entirely new world for educators. There is a unique opportunity provided here. The opportunity would require, however, that all institutions work very close together and consider the possibility of:

1. Designating schools or colleges for particular courses and programs. A major asset to this would be close proximity to other educational institutions.
2. Continuing education. This is many times referred to as adult education but the simple fact is, in any area requiring specialization there is a constant need for people to continue their education.
3. Extension division courses
4. Articulation - this is really the name of the game

We should not let institutional perpetuation be the determining factor. The purpose of program planning should be a contribution to society s development. We as educators must develop and maintain educational programs to cope with our evolving society. A program to meet the needs of yesterday, or even today, will not suffice.

ARTICULATING CAREER PROGRAMS -
HEALTH AGENCIES/SCHOOL

ROGER SMITH
Vice President
Tulsa Junior College

One must always bear in mind that the health occupations training programs that are being operated by any training institution are to provide trained manpower for the health services community. Although it is riddled with peculiarities that create constant frustrations for those operating training programs, cooperation and coordination with the health services community is still essential to the operation of quality programs.

DUTIES OF THE ADVISORY COMMITTEE

Many training institutions now attempt to maintain some system of staying abreast of manpower needs in their training service area. These systems usually include, among other things, surveys by various government agencies, professional groups, and other organizations, surveys by the training institution, and the use of task forces and advisory committees. However, the way that any institution may get the real feel for manpower needs in any specific occupation is to communicate with those who are daily involved as practitioners, employers, and supervisors. It is essential that a training institution develop and work very closely with the advisory committee dealing with each program in the health services for which it is offering training.

The advisory committee should carry on several basic functions:

1. Determine if there is need for a training program for its specific occupation. If so, determine the critical number of trained personnel that can be utilized without producing over-saturation. This is something that the advisory committee can do periodically and the training institution can adjust the numbers of trained personnel product produced according to the amount to be utilized.
2. Identify those skills which are necessary to successfully function in the occupation for which the training is being developed.
3. Identify the equipment necessary to provide a desirable training experience.
4. Identify the most desirable clinical situation to provide the most effective training.
5. Evaluation of the effectiveness of the training program as the product is absorbed into the health community. The

committee is in the best position to observe and react to how well the trained product performs on the job.

The advisory committee will provide other assets for the training institution. The committee can be invaluable in teacher recruitment. The members on the advisory committee, being conversant with the occupation throughout the region, will have contacts with quality personnel that can be brought in as instructors in the program. Another service that the committee can perform is help in student placement. Again, these committee members are the practitioners in the field, and they will be the ones who will be instrumental in the utilization of the product of the training program.

In the case of accreditation, registration, or approval by professional groups, the advisory committee will work very closely with the school, providing the necessary information and situations which will bring about the development of programs within the guidelines to qualify for accreditation. Also quite important is the assistance of the committee in the process of providing for and scheduling the clinical portion of training.

The training institution should take great care to develop these committees as advisory, to feed information and act as aids and assistants to the training institution. The development and operation of the program must remain the responsibility of the training institution. Therefore, it is necessary that the advisory committees not become administrative units within the organizational structure of the training institution. The emphasis on the committee system is not to say that a program could not succeed without a well-functioning adivsory committee, but in most cases, good programs will have well-functioning advisory committees. Through the committee system, the health services community shares in the efforts to provide trained manpower for the health services. By being involved, the health services community will be more receptive to the utilization of the product.

CLINICAL TRAINING

The majority of the health occupations training programs are to provide support personnel in the areas of medical diagnosis and treatment. The product of the programs will serve mostly in hospitals, clinics, dental and medical offices, and nursing homes. The greatest number of trained manpower will probably be hired by the hospitals. Also, a great number of the programs will use hospitals for the clinical portion of the training. A close and constant working relationship with local hospitals is necessary for training effectiveness and utilization of the product.

Since the hospitals are vital to the program in providing the clinical portion of the training, it is necessary to develop specific guidelines and regulations. When the college seeks an extended campus in the hospital, it uses these facilities only at the pleasure of the service agency. The overriding responsibility of the clinical agency is the continued safety and effective care of the patient. The college instructor's efforts must be channeled to provide appropriate clinical practice for his students. In addition to insuring the quality of patient care, it is necessary for the hospital to define its legal responsibilities.

Although cooperative activities have been handled in many ways, perhaps the most effective method is the contract or formal agreement. This method establishes the document containing activities and responsibilities of both the training institution and the hospital. It is important that the contract provide:

1. Assurance that the administrative integrity of both institutions will be maintained.
2. Defined areas of responsibility
3. A system of cooperation and development and operation of clinical experiences
4. Assurance that numbers of students in clinical areas to be used at a given time will be mutally acceptable
5. Definitions of specific obligations of the school providing faculty, supervision of students, adherence to hospital policy and standards
6. Basis for program evaluation
7. A mechanism for revision of the contract
8. Beginning and terminal dates of the contract and a renewal method

Some of the specific topics which should be covered in the contract would be record keeping, provision for clinical instructors, clarification of the emergency care for students, continual operation and orientation sessions for clinical and instructional personnel, consideration of malpractice insurance, and agreements on professional ethics codes.

Drafting of the contracts is best done by the training institution, in cooperation with those institutions which will provide clinical training for the programs. There are several reasons for this: (1) the institution should be responsible for the operating of the program, its effectiveness and the quality of the product. Therefore, the training institution should take the initiative in drafting the contract. (2) The training institution may have several programs for which clinical training is needed. Contracts initiated by the departments will provide as many contracts of different nature as the number of departments and programs involved. (3) Many training institutions will work with several different facilities in order to meet the clinical training needs. If the training institution develops the contract, then one contract, if properly done, may serve for all the various facilities and programs involved.

All too often in the past, training institutions have abrogated the responsibility of this contract development to that institution offering the clinical training. This has resulted many times in a myriad of different contracts, sometimes for the same training program. As a result, some training institutions have found themselves in an untenable situation. If the program is going to be of quality, the training institution must accept the responsibility of total coordination, including the development of the contracts.

WORKING RELATIONSHIPS WITH PROFESSIONAL ORGANIZATIONS AND HEALTH AGENCIES ON BOTH THE NATIONAL AND LOCAL LEVELS

Several health occupations now have some method of recognizing either the training or the practitioner in the occupation, or in some cases a combination of these two. The trend is toward more and more external involvement in the accreditation of the training program. In many cases external approval of programs is the basis for accreditation, examination, and licensure. This situation makes it essential that the training institutions work very closely with the various agencies and professional groups in the process of developing and operating programs.

It is particularly for the protection of the student that it is desirable for the training institution to work very closely with these external groups. In most cases, programs have been developed and implemented to meet a local manpower need. Under this condition, a training institution can proceed to operate a program without concern for accreditation or approval. Because of the manpower shortage, the product of the program will be utilized in the local region of the health services community. However, without certification or licensure, the graduate is at an extreme disadvantage. The unlicensed or non-certified practitioner cannot demand the recognized wage scale, nor can he enjoy mobility to other regions or communities and expect to perform the same occupation that he has been trained for. Therefore, he is captive to a particular locale which recognizes the training program and, in many cases, is underpaid. On the other hand, the product of the accredited program may move from community to community as manpower needs arise, and can receive wages established for this particular occupation.

By operating an accredited program, the training institution has developed lines of communication with the external agencies responsible for accreditation. As training problems arise brought by the regulations and restrictions of the guidelines laid down by the external agencies, the training institution can work on improving or overcoming the specific problems. This situation is not possible if the training institution maintains a non-cooperative role in the process of training personnel for the local manpower needs without attempting accreditation. Although accreditation is not easy, and the external groups involved in establishing the guidelines have, at times, developed unrealistic situations, the training institution should strive to operate its programs within the guidelines of accreditation.

CRITERIA FOR ADMISSION TO ALLIED HEALTH PROGRAMS

Today much emphasis has been placed on "open door" admissions and education for everyone. Certainly, each should have equal chance, but many educators have erroneously tried to apply these concepts of admission to specific programs. In the long run, this approach is unfair to the student and those financially supporting the training institution.

Health occupations training programs are expensive, and although the situation is somewhat improving, student salvage from any specific program has been rather limited.

If the student does not succeed in one of the allied health programs, it generally means that he is out with nothing to show, nothing to salvage from the training that he's had. This, added to the tremendous cost of health programs, has created a more intensive screening process for the admissions of students to these types of programs.

Therefore, the screening process is still highly desirable. Screening should be positive, not negative. Screening should be to fill programs with students with high potentials to succeed. The basic criteria for entrance into the institution only established a beginning for the selection of students into the various types of health programs. Much work has to be done in exploring the student's background to make sure that his educational foundation is sufficient to indicate success in the courses of the curriculum. It is pointless to enroll an individual into a course for which he has very little chance of success. It is better to redirect the aspirant into courses which will provide the type of background necessary for success in the health training program.

In addition to evaluation of the student's background and tested abilities, the personal interview is still vital. The nature of the health programs is such that the personality characteristics exposed by the personal interview will help the advisor evaluate the applicant's possibilities of success or failure. For instance, those who wish to become RN's but cannot deal with human relations might be better to be encouraged to go into a program where they work in the laboratory or at least are removed from patient contact.

There has been criticism of the screening methods used for health occupation training programs. It has been suggested that the methods are not effective and screening should be eliminated. Perhaps the screening methods have not scored 100% and the attrition rates are still high. However, it seems to be the method or technique which is not effective. The concept of screening is still valid and the critics should not confuse method with concept. A total effort should be made to improve the methods of screening so the procedure may be more effective. The training institution has a responsibility for the student to improve his possibilities for success.

THE RESPONSIBILITY AND CREDIBILITY OF THE TRAINING INSTITUTION

The institution offering the health occupations training program must assume responsibility for the operation and success of the program. This is not easy to do, but it is necessary and it must be done. Too many training institutions have, in the past, assumed the operation of a program without accepting the responsibility for the program. Many have inherited on-going programs which have been hospital-based and simply offered the institution's name as the sponsor of the program, and translated the topical courses from hours of training into hours of credit with very little effort on the part of the training institution. There is no way under this kind of a situation to guarantee a quality program. The program may or may not be one of quality, but if it is quality, it is only through happenstance, not through the acceptance of responsibility by the training institution.

Other training institutions have, in the past, initiated programs where the formal classroom or lab or didactic portion of the training is conducted by the training institution. The clinical portion is farmed out to other organizations of the community where clinical training is conducted without any coordination or cooperation or control of that portion of the program by the training institution. Again, quality results only through happenstance, and not by the efforts of the training institution.

Health occupations programs generally are very expensive, very costly to operate. However, the training institution has a definite responsibility to the students who are enrolled in an institution to arm them with sound quality training. Unless the training institution is willing to provide the funds and the personnel to conduct the whole program, it is better that the program not be implemented.

In some cases programs have been implemented in areas where the clinical facilities are not sufficient to provide the necessary training. Some programs have been implemented to train personnel when there is no market for the product. Training institutions accepting total responsibility for the operation of the program and who are well acquainted with the health services community are less likely to make these mistakes.

The health services have been criticized for the inefficient use of manpower. There is little doubt that this accusation is true, especially when some of the critics are professionals in the health services. The training institutions have been taken to task for not improving the efficiency of manpower utilization in the health services. This approach is not the role of educators. As members of the community, and recipients of health care, educators can be concerned. However, the health services community determines the responsibilities, activities, and functions of its members. Therefore, the housecleaning must come from within. The educators only respond to the training needs.

There is a tremendous amount of work yet to be done in the development of health occupations programs. There is a lot still to be done in becoming more efficient, more effective in the training institutions, working with the health services community, the utilization of manpower, development of programs to meet new emerging occupations, and working on new methods and techniques of student screening. We have, in the public sector of training, jumped into the health occupations training, expanding very rapidly the numbers of programs being operated to provide manpower for the health services community. However, we have only scratched the surface in the amount of work necessary to whip this area into shape and have sound quality programs.

PROFESSIONAL DEVELOPMENT FOR TECHNICAL EDUCATION PERSONNEL

JERRY S. DOBROVOLNY
Professor and Head, Department
of General Engineering
University of Illinois

The rapid expansion of technical education programs in the United States in the last ten years has generated the need for a great number of teachers, administrators and support personnel. The sources of these personnel have been quite varied, ranging from engineers from industry, teachers from other fields, and technicians who have obtained additional training. There has not been any organized program to provide training for these teachers and administrators to bring them to a level of competence from the standpoint of a philosophic understanding of technical education, subject matter capability, administrative leadership in a school structure, and the role of technical education in career education.

There have been a number of federal programs designed to provide upgrading for teachers in various areas and some of these have provided some relief for this important area of technical teacher education. Among these programs are the Summer Institute and Academic Year Institute for Mathematics and Science Teachers funded by the National Science Foundation. The Department of Labor has provided funds for training personnel who served those enrolled in the manpower training programs (13 million in Fiscal Year 1971). The U. S. Office of Education has had the responsibility of the program for upgrading teachers and personnel under the Educational Professions Development Act (EPDA). This Act covers a wide range of target groups such as the teacher corps in Elementary and Secondary Education, grants to states to meet critical shortages, Pact C of EPDA for graduate fellowships, Part D of EPDA to improve qualifications of eligible educational personnel, upgrade counseling and guidance personnel, Part E of EPDA provides graduate fellowships for teacher trainers, Part F of EPDA to train vocational and adult educational personnel through summer institutes, plus a number of other programs designed to upgrade teachers.

The money and the programs are available under the present structure to provide an excellent opportunity to prepare qualified teachers. However, there is a need to coordinate these activities in a meaningful manner to achieve the goal of developing competent educational personnel. To illustrate what can be done by an effective long range plan, a discussion of two studies conducted to evaluate the effectiveness of Summer Institutes will follow.

SUMMARY OF SUMMER INSTITUTES

The National Science Foundation was established in 1950 and reports directly to the President of the United States. Its policies are determined by a board of twenty-four members and a Director. The Foundation provides funding for basic research, applied research, education and training, and other activities. In Fiscal Year 1971, $513 million dollars were appropriated to the Foundation of which $100 million was devoted to education and training. One of the most important programs of the Foundation in the education sector has been the Institute programs.

One of the strongest thrusts of these programs has been in the improvement of mathematics and science teaching in the secondary schools. The Foundation also supported a program for junior college, technical institute, and college teachers of mathematics and science. It is under this latter program that the University of Illinois, Urbana, Illinois, received funding of eleven consecutive Summer Institutes to upgrade the subject matter capabilities in mathematics and engineering sciences of machine design technology and electronic technology teachers.

GENERAL OBJECTIVES

The target population for the Summer Institutes were those teachers who had obtained their training and background in other fields than engineering. Most of the participants were graduates of industrial education, vocational education and industrial arts programs. All of them had been teaching or were preparing to teach in associate degree type programs of electronics technology and machine design technology. The four major objectives of the Summer Institutes were as follows:

1. To upgrade the professional competence of selected post-secondary technology teachers in the chosen subject matter fields and in mathematics.
2. To strengthen their understanding of the nature and philosophy of technical education at all levels and its role in our modern industrial society.
3. To encourage them to pursue additional studies in professional and related course work at other summer institutes or at institutions in their own localities.
4. To stimulate greater participation in professional organizations and activities and assume a more active responsibility in the promotion and furthering of technical education in their localities.

SUBJECT MATTER ORGANIZATION

Subject matter presented in the Summer Institutes was structured to permit a number of participants to possibly attend two or three successive institutes and thereby obtain an indepth capability in their particular subject matter area. The courses in mathematics and the engineering sciences were taught by regular staff members of the College of Engineering with a particular understanding of the needs of the participants.

An attempt was made to select homogeneous groups for each of the Summer Institutes but the experience indicated that this is practically impossible to do because of the wide range of backgrounds of the participants.

Therefore, the attempt to provide this homogenuity resulted in having the so-called basic program offered in two successive summers to different participants in each case. Then the second Summer Institute in the series would select the more promising participants from the first two basic programs along with other participants with similar backgrounds. The third summer program again enabled a number of those participating in the second program to continue on along with other new participants.

The participants took two subject matter courses along with a seminar. One of the subject matter courses normally was a course in mathematics.

RESULTS FROM STUDY

Two studies have been conducted. The first study covered the Summer Institutes conducted in 1961 to 1965 inclusive. This was published in 1968 by Dobrovolny and Hartley. The present study covers the Summer Institutes from 1966 through 1970. The results will be published later in 1972. The data from the study presents the perception of the participants of the effectiveness of the Institute, the relevance of the courses and the contribution to the clarification of the philosophy of technical education and the effects of the Summer Institutes on the amount and nature of the respondent's participation in professional activities. A selected number of items from the study are presented to indicate the effectiveness of Summer Institutes in providing upgrading experiences for technical education personnel.

Effect on Views of Technical Education

The respondents indicated that 43.7% experienced a large effect on their views of technical education and 45.6% a moderate effect on their views. The overwhelming majority of the respondents indicated that the Institute had a profound effect upon their views concerning technical education. This indicated the effectiveness of the Seminar course in which attitudinal and philosophic matters were discussed. Another question measured the positive or negative effect towards their views on technical education. 71.8% indicated a strong positive reaction and 18.4% indicated a neutral reaction. Typical comments in the open-ended part of the question indicated such items as "clarified my views on technical education;" "learned a great deal;" "strengthened my perception of technical education;" "profited from interaction with other students."

Motivation for Further Study

The necessity for further academic training was stressed by the Institute staff, especially in the subject matter area. 30.1% of the respondents completed degree requirements since their participation in the Summer Institute and indicated that this was a direct result of participating in the Summer Institute. Eleven percent obtained master's degrees in technical areas, nine percent master's degrees in education, one percent a doctor's degree and the remaining obtained bachelor's degrees or associate degrees. Several are continuing to work on doctoral degrees.

In addition to this, 63% of the respondents indicated that they were planning to take one or more additional regular term courses at technical institutes, colleges or universities. In terms of the kinds of courses they planned to take about eight percent indicated these would be in mathematics, 35% in the technical subject areas, 22% in education courses and 11.7% in other courses.

A significant number also responded they had participated in various self-study programs to upgrade their competence. The majority of the respondents, 69% indicated that they had engaged in a self-organized study in order to increase their competency to teach technical courses. However, 28% of the respondents indicated that such efforts had only a small or no effect upon their work.

Effect on Subject Matter Competence

The majority of the respondents, 85%, indicated that the Summer Institute had a large or moderate effect upon the increase in competency to teach technical courses that they had taught prior to the Summer Institute. The majority of the respondents, 75%, replied that the effect of the Summer Institute to teach new courses was large or moderate as a result of the Summer Institute.

Perception of Need for Colleagues

The respondents indicated that 88.5% perceived the need for their colleagues to attend such a Summer Institute. 81.5% of the respondents indicated that their attendance at the Summer Institute was instrumental in their perception of the need of their colleagues for similar educational experience, 83.5% of the respondents indicated that they had tried to interest some of their colleagues to attend the Summer Institute at the University of Illinois and 43% indicated that they tried to interest their colleagues in attending Summer Institutes at other institutions. They were also asked if they tried to interest any colleagues in attending regular term courses at some college or institution in their area; 48.5% indicated that they had. These answers are very significant and point to the need for continuing effort in providing opportunities for educational upgrading in subject matter areas for practicing technical teachers.

Change in Employment

The majority of the respondents, 92%, replied that they had not changed employment since they left the Summer Institute. They were asked what effect the Summer Institute had on their change of employment and 33.9% stated that there was no effect on change of employment. Two other groups stated that the Summer Institute had a large effect, 5.9%, and 5.9% also indicated it had a moderate effect.

However, with respect to the effect of the Summer Institute on the responsibilities of the participants, there was a 31% response that there was a significant change. 65% said there was no change and four percent did not respond. The 32% of the respondents stating they had changes in responsibilities indicated that they were promoted to positions of higher teaching or administrative responsibility. When one considers this normally in less than five years since they left the Summer Institutes, the percentage is significant.

Membership and Attendance to Professional Organizations

One-half the participants indicated they were members of at least one professional organization. These include the American Vocational Association, the National Education Association, American Society for Engineering Education, American Technical Education Association, the Institute of Electrical and Electronics Engineering, the American Society of Mechanical Engineers. 39.8% of the respondents indicated that the Summer Institute had a large or moderate effect on their deciding to join professional organizations. With respect to attendance of meetings and professional organizations, 28% of the respondents indicated that the Summer Institute had a large or moderate effect on their attending professional organization meetings.

With respect to presenting technical papers at professional meetings, nine percent of the respondents indicated they had presented technical papers and 6.5% indicated that they had technical papers published. Three percent of the participants indicated that they were either writing or have had a book published since the Summer Institute. Those that were involved in publishing papers and books indicated the Summer Institute had a large effect on this activity.

Talks on Technical Education

Half of the participants (49.5%) indicated that they had given one or more talks before local non-professional groups regarding technical education. Of those that had given talks, 36% indicated that the Summer Institute had a large or moderate effect on presenting talks to local groups. The number of talks given by individuals range from one to twenty. The largest number of respondents, 26%, reported giving one to three talks.

Most Worthwhile Aspects of Summer Institue

A large percentage (41.7%) of the responses indicated that the overall learning was the most favorable aspect of the Summer Institute; 40.8% indicated that interaction with others in their own field was significant in their evaluation. The technical subject matter in the courses was rated 38.8%, mathematics courses 18.4%, personal stimulation received 12.6%, opportunity to investigate new instructional methods 9.7%, and the remainder was attributed to miscellaneous items.

Conclusions

The overwhelming positive effect on the participants in enabling them to achieve the objectives of the Institutes, indicates that the vehicle of the Summer Institute provides an effective manner for the upgrading and retraining of technical teachers. Another important point that was reinforced as a result of the study is the fact that a structured program of two or three summers is more effective than merely going to a series of unrelated programs or activities.

Two other studies at the present time are in progress. These are follow-up studies of the participants that participated in five Academic Year Institutes and a ten-year follow-up study of the first five-year group. The preliminary data from these studies indicate that the Academic Year Institute is the most effective manner for upgrading subject matter of the participants. A significant number of the Academic Year Institute participants have continued on to work towards a doctorate in technical education and another significant number have moved up into responsible administrative positions.

The participants that were in the first five programs have also moved up into administrative positions but not to the extent that the participants from the Academic Year Institute have succeeded.

FUTURE NATIONAL SCIENCE FOUNDATION SUMMER INSTITUTES

The funding for these types of institutes in the future will probably continue to be decreased as the priorities for the National Science Foundation change to meet the needs of our society for the Seventies. One of the objectives that the National Science Foundation had for the summer institutes and academic year institutes was to effect a change in the content of the college and university curricula that prepared teachers. The Associate Director of Education of the National Science Foundation testified before Congress that the summer institutes and academic year institutes did not have the desired effect upon pre-service teacher training that had originally been set as one of the objectives. This is a problem that will be discussed later on in the paper.

THE CHALLENGES OF THE SEVENTIES

As we enter the decade of the Seventies, we find the total education system in the United States woefully lacking in providing the kind of education and training for citizens to function productively in the society that surrounds them. There are over 52 million students enrolled in this educational system from the kindergarten through the institutions of higher learning. The operating costs of these schools and colleges exceed 67 billion dollars, with over 29 billion being spent on the 3 million persons involved in the system. When one considers that the success of any educational program is only as good as the teacher involved in the program, we must take a hard look and come up with some good positive answers in terms of redirecting the bureaucratic structure in such a manner to provide the kind of education for our youth to compete effectively in the society.

U. S. Commissioner, Dr. Sidney P. Marland, Jr., during the past year, has articulated the concept of a career education thrust in our total educational system. This concept has caught on like wildfire and everybody is using the term. Many are using it as a replacement for vocational education. Others are substituting it for the term occupational education. When in reality it is a challenge to the entire educational community to redirect their curriculums, their instructional effort, their teaching techniques, the utilization of new media and harness these together in a systems approach to develop a career education thrust in the total educational system.

Central to the success of this activity is the redirection of our efforts in the preparation of teachers. A massive effort is required similar to that which occurred immediately in the post-sputnik area to retrain our mathematics and science teachers. The need now is to retrain all of our teachers to be effective agents of career education. This applies to the elementary school, secondary school, general education at our colleges and universities, the administrators, the colleges of education----the entire system.

NEW POLICY NEEDED

The National Advisory Council on Education Professions Development, in its report entitled "Windows to the Bureaucracy" released Wednesday, January 26, 1972, writes unequivocally that what is lacking is a stated policy that will effectively establish goals to be consistent with the needs of the Seventies and provide a systems approach to articulate the implementation of this policy in such a manner as to reach the goals. The recommendations in this report are as follows:

> "...that the President place special emphasis on the need for improvements in policy formulation by all units of the Executive Branch concerned with education professions development;
>
> ...that the Congress --
>
> continue its support of legislation which provides the units of the Executive Branch with the flexibility needed to insure effective outcomes in education professions development;
>
> provide the funds and staff needed by agencies which administer education professions development programs to develop sound policies in this important field of endeavor;
>
> require the kinds of reports - with particular emphasis on policy statements - which will enable it to make sound judgments about the effectiveness of Federal programs in education professions development;
>
> provide the funds and staff to Congressional committees to enable them to give the most careful scrutiny to policy statements and other reports;
>
> ...that all those concerned with educational policies, in or out of government, communicate to this Council alternatives to the recommendations outlined in this report or ideas which they feel will strengthen the process of policy-making in Federal education activities."

RECOMMENDATIONS

At the present time, Congress is appropriating over 300 million dollars annually to support Federal programs designed to improve the effectiveness of educational personnel. When one considers the fragmented distribution of these funds in the various Federal agencies with no coordinated activity, it does not take much imagination to realize that we need to have some immediate action to bring about a coordinated and articulated policy based on the systems approach.

In the systems approach, we must take into account not only the preparation of educational personnel from the standpoint of subject matter competence and pedagogical capability, but we must articulate this with curriculum development, administrative commitment, and bureaucratic redirection.

The effective implementation of a policy in training teachers for the Seventies must take into account not only the redirection of the efforts of all of our colleges of education, but to involve the competencies of the leadership in business, industry and the professions. The need for evaluation is a central core in all of our efforts in teacher preparation and retraining must be incorporated in the policy plan.

ROLE OF THE TECHNICAL TEACHER

Since the technical education movement in the United States is relatively new, the personnel involved in this activity have come from a wide range of sources as is indicated before. In the relatively short time that these personnel have worked together, some extremely effective and outstanding programs have been developed throughout the United States. Because of this record of cooperation and the use of the systems approach to the solution of the problems with respect to technical education, the leadership in technical education must project itself beyond the immediate confines of their own particular programs and provide the leadership within the communities, the states, the universities, and in Federal government to bring about a complete change in the direction of our total educational system. And by leadership, I mean all of the people involved in technical education; the teachers, the administrators, the college professors, and state and Federal employees that are working in the field of technical education.

We must band together and carry forth the united message of the need for revamping our total educational system and redirecting all of the teachers in the direction of career education. We must be thoroughly informed with respect to the facts and figures as they relate to the manpower needs of our nation of the Seventies, the misappropriation of our funds from Congress, and bring these changes about. As an example, Part F of EPDA, that is specifically identified for the development of vocational and technical education personnel, has no effective input from the leadership in the Bureau of Adult and Vocational Technical Education. The monies for this program come from VEA 1968 funds. In a recent conversation with individuals who have reviewed the projects funded under Part F of EPDA; the indications are that the money is really being spent to support the same old ineffective programs that have failed in the past. We need new innovative programs with new leadership, new bureaucratic reorganization. The personnel involved in technical education must play a central role in bringing about this redirection.

NEW MATERIALS FOR TECHNICAL TEACHERS

MAURICE W. RONEY

Executive Vice President

Texas State Technical Institute

Technical education has been handicapped by a lack of good instructional materials. The textbooks and workbooks available in many specialized technical fields are either too theoretical for use at the technical level or, at the other extreme, are oversimplified. In the all-important areas of mathematics and physics, the few books written at the intermediate college level, with practical applications, are often rejected by teachers in these disciplines as being "too narrowly specialized" for their use.

It has become increasingly obvious in recent years that textbooks, in their traditional form, may become less and less significant in technical education. With all due respect to those who labor to produce these volumes, more and better books will not provide the means to program improvement and expansion in the future. The real need is for new learning systems that do not rely on the traditional textbook-based method of instruction.

There are several valid reasons for the trend away from the traditional world of books and toward new materials and techniques.

The textbook-centered system of instruction is basically academic, patterned after the traditional system in which most of today's teachers grew up. Books tend to become ends rather than means to learning. They put a premium on verbal skills thus discouraging many capable students who respond more readily to physical applications of technical principles. What is desperately needed in technical education is laboratory-centered instruction. Instead of textbook theory, poorly explained by inadequate laboratory experiences, we need topflight laboratories where technical principles can be learned by applications.

The inherent weakness of textbooks is painfully evident in the newer technologies. For example, in the initial planning stages of the Electromechanical Technology (E.M.T.) research effort*, it became apparent that working within the limitations of available texts and references would make the developmental task virtually impossible. The principles of electromechanical technology are cross-disciplinary. Consider, for instance, a concept such as Impedence Matching. No single volume contains application of impedence matching with electrical, mechanical, pneumatic, hydraulic, thermal, and optical examples. The only course open to the E.M. Research Team was to develop new materials with laboratory experiences as the central teaching medium.

*Technical Education Research Center Project No. 8-0219

Another weakness of textbook-based instruction appears frequently, even in well-established fields such as electronics, mechanics, or chemistry. Most textbooks assume that some form of laboratory work will be provided to illustrate the principles being taught. But the effectiveness of laboratory work can vary greatly, and the overall effectiveness of the learning varies accordingly. Laboratories may be good, bad, mediocre, or even nonexistent. It is easy to minimize the laboratory on the assumption that the "good" student (meaning, of course, the good reader) will learn from the textbook. To complete the cycle, performance is measured by written tests, again deemphasizing the laboratory by a reliance on verbal responses. Administrators, mindful of the high costs of technical instruction, are often all too willing to rationalize the omission of laboratories on the premise that hands-on experiences are skill-oriented or that industry should provide these experiences.

Colleges and universities have systematically reduced laboratory instruction in recent years. The results can be seen in high attrition rates and decreasing job opportunities for graduates. If technical schools are to avoid the situation that now exists in academic institutions and programs, technical instruction must be laboratory-oriented.

NEW DEVELOPMENTS IN INSTRUCTIONAL MATERIALS

One of the most interesting developments in laboratory based instruction is the Technical Physics Project of the American Institute of Physics (A.I.P.). Working under a grant of funds from the National Science Foundation, the A.I.P. is coordinating the work of four centers devoted to the development of physics modules for technical curricula in two-year colleges and technical institutes. Optimally, these modules, along with others in the future, will replace the traditional off-the-shelf experiments so familiar to physics laboratories today. The A.I.P. modules illustrate principles by making use of modern industrial equipment in preference to the old style simulators that are almost always dull and uninspiring to technical students.

The American Chemical Society (A.C.S.) has done similar developmental work in chemical technology. Instructional materials for some 30 semester hours of work have been developed using a format that is quite different from anything previously available in chemistry. Instruction proceeds from laboratory to theory in order to make better use of the laboratory as a motivational factor in learning. Real world examples are used in the laboratory; Geritol is analyzed for iron content; commercial solvents are analyzed; instrumentation is introduced early in the program; and descriptive material related chemistry to the practical needs of technology. Additional work is underway to modularize these materials, and some units have been developed for computer aided instruction.

The most extensive work in laboratory-oriented technical instruction has been done by the Technical Education Research Center (T.E.R.C.). In addition to basic work in Electromechanical Technology, T.E.R.C. has produced materials in the fields of Biomedical Equipment, Laser-Optics, and is currently underway with field studies and task analyses in Nuclear Technology.

A NEW INSTRUCTIONAL SYSTEM

Perhaps the most significant aspect of the work being done by T.E.R.C. is the development of the technical core concept. It became evident during the testing of the first-year instructional materials in E.M.T. that these materials could be extremely effective in breaking down some of the barriers that have been built around disciplines and technologies. The E.M.T. first-year core program, in effect, provides a coordination of effort in all concurrent courses, including mathematic and communications skills. Multiple reimforcement of learning is obtained, and the results to date have been encouraging. By utilizing multiple laboratory applications designed to illustrate technical concepts one at a time, an entirely new order of instruction has been achieved.

Under the general title of Electromechanical Technology, eight action-oriented instructional manuals have been prepared covering approximately 30 semester hours of integrated course work*. For scheduling purposes these manuals are in four groupings: Electronics,

---

*Available from Delmar Publishers, Mountainview Avenue, Albany, New York 12205

Mechanisms, Electro Mechanisms, and Unified Physics. The unique feature of these manuals is that each covers the same principles but with applications in separate technical fields. The principles, taken in the order in which they appear, are: Differential Forces, Flow Rates, Resistance, Energy Storage, Time Constants, Impedences, Resonances, Waves and Fields, Amplification Feedback and Stability. It should be obvious to anyone who knows technical education that concepts such as these would remain as only vague generalizations to the technical student without well-planned laboratory experiences.

If and when technical education becomes truly laboratory oriented, it should be possible to modularize units of instruction, develop behavioral objectives, more to individual self-paced instruction, and utilize computers for monitoring. None of these things can be accomplished, however, without many man-years of basic developmental work of the type being done by A.I.P., A.C.S., and T.E.R.C.

THE NEED FOR A COORDINATED EFFORT

One thing needs to be done on a national scale. Without doubt, much good work is being done in technical education laboratories throughout the country. Somehow, the national effort in technical education needs to be coordinated and the results of this effort should be widely disseminated. An independent organization such as a National Commission might be formed to provide this coordination. Similar Commissions have been in operation for some time in specific disciplines, Physics and Chemistry, for example. These Commissions have rendered a valuable service by pinpointing needs and promoting R&D activities designed to supply these needs. A National Commission on Technical Education could do a great deal to identify specific needs, recommend areas for developmental work, and assist in making technical education needs known to the various funding agencies.

SUMMARY

In summary, I believe that technical educators can and should avoid the patterns of instruction established over the years by our academic counterparts in the higher education system. We have responsibilities that extend beyond serving only those students with high verbal skills.

The most exciting new developments in technical education are laboratory-oriented instructional materials that may make the textbook obsolete. Many areas of technology are literally undeveloped or, at least, are unreported. A National Commission for Technical Education could perform valuable services in the years ahead as technical education services expand.

One word of caution may also be in order. There are always many "can't do" individuals who look with suspicion on any new developments that appear to threaten their position. Beware of those who feel constrained to defend the status quo by pointing up past successes. We must avoid the tendency to become complacent or oversensitive to suggestions for change. The educational system in America will undergo significant changes in the next few years, and the leadership for much of this change must come from the technical education profession.

TECHNICAL EDUCATION FOR THE DISADVANTAGED

REBY CARY

Associate Dean of Student Life

University of Texas at Arlington

Booker T. Washington could well have been the Black Nostradamus of his day. As he gazed into his philosophical crystal ball, he saw answers to the acute problems of his race in the 1800's. They were in response to the pragmatic reality of Blacks living in a hostile society. Black militants, then and now, assailed his philosophy as "Uncle Tomism." Yet, in the year of our Lord, 1972, his projected hypothesis of vocational and technical preparation is relevant and worthy as a viable and possible solution to the problem of the disadvantaged.

Washington understood the failure of Reconstruction and the basic ingredients of the American economic system. He pleaded for Black assimilation and adoption of the ethos of American competitive society by simply beginning to compete. The doctrine envisaged economic self-help, but submission to the materialistic American culture, based on the gospel of work and money. It is here that Blacks are disadvantaged. The economic system is the dominant influence in America. Blacks are deprived because they are not able to function in our economic structure. Washington also had long range goals of developing Black business. This entrepreneural venture would be the final consummation whereby the influence of the race could be increased in the American economy and, as a result, economic and political freedom.

The white middle class clings tenaciously to the philosophy of Washington by attempting to limit and restrict the money-paying trades as exclusive domains of white workers. In 1969 Black Americans made up 11% of the total population. In November of 1970 the unemployment rate for Black Americans was 8.8% as compared to 5.5% for whites. Those Blacks who were craftsmen, foremen, and kindred workers comprised 0.60 of non-white workers and the professional, technical, and kindred workers, 0.59 (Rodgers and Bullock, Law and Social Change, p. 115). Thus a large number of job opportunities have been denied men of color and training not provided in segregated educational environs.

Another practical legacy of Booker Washington is his belief that "in the struggle for freedom, the first round is with oneself." Blacks must overcome the slave psychology of the importance and dignity of menial work. School counselors need to reappraise the emphasis on academic excellence at the exclusion of vocational and technical profficiency. The second step is to gain self-knowledge by coming to grips with reality -- This is the job of education. Where are the opportunities for employment? In what areas of specialization are there demands for laborers?

How many high school counselors discuss with their students the appropriateness of technical programs as a career oriented direction? High school guidance programs in most schools in the U.S. are middle-class oriented and pointedly inadequate for the minorities and poor whites. How many scholarships are available for outstanding students in technical skills? The quest for scientific and technological knowledge is bound to grow thus making it mandatory that our schools and curricula change to enable the students to adjust to a dynamic and ever-changing society.

A high school diploma is a minimum requisite for young people entering as occupation today. "30% of U.S. high school students never graduate and in some blighted urban areas, the rate may be 50%." Technological unemployment and union exclusiveness make dropouts unemployable. "Unwanted, they wallow in anger and sometimes crime." (Time, January 26, 1962) Education is the crucial deterrent to the explosion of this social and economic dynamite. The major "crunch" of the future is at the point of entry to the labor market rather than at the college door.

In most schools, students who are the trouble makers and whose chances are nil in getting into college, are guided to the technical and vocational programs which carry the label of "lower quality." The student is permanently penalized even if he voluntarily chooses a vocation by being forced on a "track" and foreclosed from continuing his education in another field -- credit for subjects pursued in the vocational area will not be accepted in institutions of higher learning.

Thus, technical and vocational programs suffer irreparable harm because "good students shy away, teachers are difficult to recruit, industry remains standoffish" (Venn, Man, Education and Work) and minorities look with disdain on vocational and technical programs. The psyche of black and white are of pre-Civil War vintage.

Nevertheless, vocational and technical occupations must be taught within the secondary educational system and reinforced in the two year colleges. Technology demands workers with vocational training and related education. If a healthy economy is sustained by increasing productivity -- the economy needs skilled technicians to maintain its momentum. If our educational goals aren't changed to meet this demand, then we will have "a large and dangerous body of unemployed and underemployed, too poorly educated and skilled to participate in the new technological economy." (Grant Glenn, Man, Education and Work, American Council on Education, 1964).

But the disadvantaged will continue to occupy the lower strata of the economic ladder. Radical assertions seem justified when they contend that our capitalistic society insulates itself with a layer of poor and unemployed as a source of cheap labor. Despite gains in social and political areas, Blacks are losing ground in the economic and occupational area. More than likely, most Blacks still attend "neighborhood schools" that have primary and secondary schools with facilities, faculties, and resources below the national average. Then they must compete with whites who live in their own neighborhood who are exposed to technican and other related skills that are adequate for preparing them to enter the labor market.

"Vocational and technical education must be accorded a better-defined and accepted place within the educational community." The Junior College becomes the panacea for the problems of the disadvantaged.

Kenneth Clark hypothesizes "the need to reorganize large public school systems away from the presently inefficient and uneconomic neighborhood schools to modern and viable systems of organization such as educational parks, campuses, or clusters must be sold to the general public in terms of hard dollars and cents and education efficienty benefiting all children"....

He further emphasizes "the need to consolidate small, uneconomic, and relatively ineffective school districts into larger educational and fiscal systems in order to obtain more efficient education for suburban and exurban children..." ("Alternative Public School Systems," Harvard Educational Review, Vol. 38, Winter, 1968, p. 107).

An outstanding example of a school meeting the needs of the disadvantaged is Chicago's Dunbar Vocational High School in the sea of poverty of Chicago's Southside. According to Time, January 26, 1962, this school offers training in 28 skills from welding to aviation electronics. The Administration is genuinely committed to "upgrading Negroes on the economic scale -- first by the best possible training, second by fighting for job opportunities."

A salient feature of this school is that contrary to stereotyped views concerning the disadvantaged, discipline is well at hand, 'Future aircraft mechanics are too busy peering into a jet engine, or revving up a mounted piston engine, to get into much trouble." These students also acquire the basic academic work to enter college if they wish to ("10% to 15% do").

One of the changing roles of the Junior College is to assume the major responsibility for occupational education beyond the high school. Most universities of higher learning have retreated to their elite tower of intellectualism and have not accepted technical and vocational education as their responsibility. The responsibility belongs to the Junior College; this institution must reinforce the programs in the high schools, provide training for those who drop out, bridge the lag between what is taught in the high school and what is actually practiced in industry and provide industry a viable workshop for its technological obsolescence.

The Junior College must continue to strengthen its "love affair" with industry. The common interest of both is the cardinal basis of mutual benefit to the nation. The many instances, businesses have initiated their own programs to train the disadvantaged but the Junior Colleges must reassert their expertise in training and let business provide the practicum and/or work-study programs to make their training meaningful. A good example is that of the First Pennsylvania Banking and Trust Company of Philadelphia.

Selected students "spent mornings in the classrooms and worked afternoons at the bank where they received pay as well as school credit. Each Friday afternoon students listen to the bank and outside speakers discuss business and civic affairs... Remedial education and group counseling were made available to increase the trainees proficiency and confidence. (Benjamin Pearse, Business, Industry and Education, November, 1968, p. 13-14). All but one of the 25 boys from the "dropout prone" schools finished the course. Nine of the seniors in the group were offered permanent jobs and three went to college."

Business has attempted to rectify the bad practice of our educational institutions of following the "separate but equal approach to education." The problems of today make it imperative that a revitalized educational program will be formulated which will allow vocational and technical education to develop rapidly within the most effective educational framework.

Vocational and technical programs in the Junior Colleges must have balance and diversity. Business education, technicians for industry and engineering research, health technology and other paramedical fields, jobs in the public service and the whole realm of service industries must be expanded to serve the manpower needs of the nation. Through guidance counseling and occupational education, minorities must be included in the work-a-world drama. Education is a vital and continuous process; it is the key to continued economic productivity in the decades ahead. Vocational and technical skills are respectable tools in the 70's.

The only alternative to violence is a sound system of education which provides an opportunity for participating in the great American dream. Alfred North Whitehead's statement made in 1917 is relevant today.

> "In the conditions of modern life the rule is absolute, the race which does not value trained intelligence is doomed. Not all your heroism, not all your social charm, not all your wit, nor all your victories on land or at sea, can move back the finger of fate. Today we maintain ourselves. Tomorrow science will have moved forward one more step, and there will be no appeal from the judgment which will then be pronounced on the uneducated.
>
> (*The Aims of Education and Other Essays*, 1949, p. 25.)

Our narrowly defined eucational systems must be modified if this nation is to solve some of its major economic and social problems. There is no retreat from the technological changes in our society. These changes demand manpower; this manpower can be effective only if it is adequately trained. The disadvantaged are essential cogs in the crucibles of human resources and their talents must not be wasted.

ADMINISTRATION OF DENTAL PROGRAMS AT THE POST-SECONDARY LEVEL

THOMAS A. MCDERMOTT
Regional Dental Program Director
Bureau of Health Manpower Education

I was asked to meet with you this afternoon to provide you with some information concerning various legislative activities within the Federal Government which may affect dental auxiliary training at the post-secondary level. I hope that my comments will prove useful to you in planning your future teaching programs.

Before entering into a review of the changes that presently are taking place in dental education, I feel that I should discuss some past events which have led dental educators and other dental leaders throughout the country to re-evaluate the adequacy of many of the traditional programs taught in our Nation's dental schools.

It now is quite evident that the feeling exists that many of the educational technics used in our dental schools are not sufficient if we are to graduate dental students capable of meeting their responsibilities in regard to the oral health of the people of their communities.

There never has been a time in the history of this Nation that changes in our everyday way of living have come so fast and have been so dramatic. These changes have resulted in the development of many new concepts regarding the delivery of health services. Problems encountered in delivering health services today tend to be more social and economic rather than scientific and technological. Hence, educational programs designed to properly prepare our health professionals to provide necessary health services must be sensitive to the social pressures of a newly awakened, demanding public.

In the area of dental education, it is no longer sufficient to train dental personnel merely to be superior technical operators. They must be sensitive to the individual and community needs of the public which they serve. They also must deliver these services within a system which is designed to meet the needs of all our citizens.

Before reviewing the new educational programs which are being developed in our dental schools, let us look at the magnitude of the Nation's oral health problems. Although technological advances during the past 25-50 years have resulted in a quality of dental care in this country second to none, our oral health picture is not bright and is becoming dimmer with each passing year.

Dental caries or tooth decay affects the population almost universally. It begins early in life and unless checked will continue throughout life in an irreversible pattern resulting in the eventual loss of all teeth. By the time our children reach adulthood, many of them already have become dental cripples. Nearly one-third of the population of this country past the age of 35 are without any of their own teeth.

Periodontal disease, the disease that attacks the gums and the bones which surround the teeth, is no less a serious problem. As with dental decay, it begins at an early age, is progressive and assumes critical proportions from young adulthood onward. It is the greatest cause for tooth loss among adults resulting in nearly one-third of the population of this country without any of their own teeth past the age of 35.

Three out of four who have one or more healthy teeth are suffering from periodontal disease, and a third of them have it in the advanced or destructive stages.[2]

Although dental decay and periodontal disease are by far the most common and widespread of our oral afflictions, other serious problems of the oral cavity cannot be overlooked.

More than half of the Nation's children are victims of malocclusions which could interfere with their ability to masticate their foods properly, and affect their physical appearance and their overall health. Treatment for these problems often are prolonged and expensive. Oral clefts are present in one out of every 800 live births, ranking third in congenital malformations behind urinary disorders and club foot.[2] Oral malignancies make up approximately 4% of all cancers with an incidence of approximately 15,000 new cases per year. The survival rate is extremely low with only about one half of these individuals surviving more than five years.[3]

Magnifying the seriousness of this grim oral health picture are the physical, social and environmental problems which preclude many people from obtaining dental services. Over 4 million people are so limited in mobility that they are unable to get to a dentist's office without great difficulty or help from others.[4] Over one million of these cannot even leave their homes. Many millions of others simply cannot afford adequate dental care or cannot receive treatment easily due to a lack of dental manpower close to their homes.

Nevertheless, the people of this country feel that high quality health care is the right of all and not just the privilege of a favored few. These feelings have been conveyed to Congress which has responded, during the past few years, by enacting an unprecedented amount of health legislation directed toward making adequate health services available to all the people of this country. Much of this legislation is concerned with health manpower training program and should be of particular interest to you.

The Comprehensive Health Manpower Training Act of 1971 which extends and amends the Health Professions Education Assistance Act of 1963 provides new authority for a variety of educational activities directed toward resolving health manpower shortage problems and improving the quality of professional education programs. Included under this authority are grants to construct, expand or renovate schools of medicine, osteopathy, dentistry, veterinary medicine, optometry, pharmacy, podiatry and public health. Another part of the legislation provides for capitation grants to health professions schools which are directed toward encouraging the establishment of shortened curriculums, promoting auxiliary training and increasing enrollment.

Still another section provides special grants for projects which would strengthen, improve or expand programs for training health professions personnel or which would increase the supply of personnel in such professions. Of particular interest to educators in junior college and community colleges are the project funds available for training in the use of the team approach to the delivery of health services, programs for training physician assistants, dental therapists and other health profession's assistants, and programs designed to increase the supply and distribution of health manpower to meet the health needs of the Nation. Since many of our professional schools already are over-burdened in carrying out their present teaching loads, they will have to work more closely with their sister Schools of Allied Health to implement many of these new training programs.

Another portion of this Act which could have direct effect upon your training programs is the Health Manpower Education Initiative Awards. This section is very broad in scope and was designed to improve the distribution, supply, quality utilization, and efficiency of health personnel and health services delivery systems. Included is grant or contract support for the following types of projects:

1. Training programs leading to more efficient utilization of health personnel.
2. The initiation of new types and patterns or the improvement of existing patterns of training, retraining, continuing education and advanced training of health personnel including the training of physician assistants, dental therapists and pediatric nurse practitioners.

3. Encouraging new and more effective approaches to the organization and delivery of health services through training individuals in the use of the team approach to delivery of health services.
4. Assisting State, local and other regional arrangements among schools and related organizations and institutions to carry out the purpose of this sub-section.
5. Grants or contracts also are available to plan, develop, demonstrate, establish or maintain any of these programs.

The initiation of many of these programs could affect greatly the design of your particular allied health training program. You should open up your lines of communications with the professional schools in your area in order to work cooperatively with them in the development and implementation of these programs. Your resources will prove invaluable if our Nation's professional schools are to respond adequately to these requests of Congress.

Another important legislative act that I am sure many of you are familiar with is Title II of the Health Training Improvement Act of 1970 which supports training programs in the allied health professions. Just as the Comprehensive Health Manpower Training Programs are administered by the Division of Physician and Health Professions Education of the Bureau of Health Manpower Education, these are administered by the Allied Health Professions Branch of the Division of Allied Health Manpower of the same Bureau. The purpose of these programs is to increase the number of qualified health professions personnel for employment, to strengthen and increase programs that prepare allied health educators, administrators, supervisors and specialists, and to develop better coordinated patterns of education and training of allied health manpower.

Among the various grant programs administered under this authority, the following should be of particular interest:

1. The special improvement grants which are designed to assist allied health professions training centers to provide, maintain or improve their allied health training programs. Support is available for such activities as enrollment expansion, curriculum improvement, academic and clinical program coordination improvement, programs for special groups such as veterans, the economicallly or culturally deprived or persons desiring to re-enter the allied health field. An allied health training center is defined as one which has at least twenty students in the basic professional phase of training in one of the approved Bachelor or Associate Art degree programs with no less than six students in any one program. The Center must be formally affiliated with an appropriate professional teaching institution and be accredited by the accrediting body of the State. Grant funds may be used for salaries, equipment and limited building renovations.
2. Special project grants are available to establish, demonstrate or develop programs that will contribute to the improvement and strengthening of allied health teaching programs, curriculum evaluation technics, retraining, new types of health manpower and the like. These grants could be used to develop and implement programs

to train new types of dental manpower such as a dental therapist or an expanded function auxiliary. If you are located near a dental school, it would be well to work with the school to develop appropriate dental auxiliary training activities to complement their educational program. These grants also pay for such items as staff salaries, equipment and limited renovations.

3. There also are two types of advanced traineeship grants which may be used by a school or institution to support students who have completed their basic professional preparation in allied health and desire further training to advance themselves in their selected allied health field. These grants support either the formal education programs of the institution or the more informal types of short term training which are most suited for continuing education programs. Included under this support are student stipends, institutional tuitions and related fees.

This brief overview of legislative programs administered by two divisions of the Bureau of Health Manpower Education, which are directed toward improving the Nation's supply of health manpower, should give you some idea of the intense interest that both Congress and the Administration have in raising the Nation's level of health. This interest is due in part to a public demand for more and better health care services accessible to all. Much other legislation has been enacted which affects health manpower training and is supported by other organizations in HEW or other Federal Departments, Commissions and programs. For more information concerning these programs, I would refer you to the publication entitled "Inventory of Federal Programs that Support Health Manpower Training, 1970" which has been compiled by the Bureau of Health Manpower Education, National Institutes of Health. This inventory can be obtained on request from the Bureau's central office in Washington, and if you do not have a copy, I would suggest that you obtain one.

The interest and activities in health manpower training has had a strong impact upon the dental profession resulting in many changes in dental educational programs and in methods used to deliver dental health services in order to meet the present and future oral health needs of the public.

As I indicated earlier, the growing disparity between the demand for dental care and the ability of the profession to meet this demand under our present system of providing dental health services has resulted in a number of experiments and demonstrations which are directed toward exploring new methods to increase dental productivity. The increase in demand for dental services is the result of a number of significant social and economic changes in this country. Population growth together with growing family incomes and a heightened awareness of the need for dental care as a result of rising levels of education have significantly increased this demand. Furthermore, new health programs supported both through private industry and by various governmental agencies have removed deterring economic barriers and have enabled millions of people to seek dental care who previously could not afford to do so. Present projections indicate an even greater shortage of dental manpower even though increases are expected in the number of dental graduates during the rest of this decade.

Thus, if future demands for dental services are to be met, steps must be taken to increase dental productivity, not only by graduating more dentist but also by increasing our available supply of dental auxiliaries and by utilizing these auxiliaries in a more efficient and effective manner.

Previous studies conducted by the U.S. Public Health Service and others, indicated that dentists could increase their productivity by as much as 75% using multiple chair technics and well trained dental assistants.

The next logical step in increasing productivity was to determine what duties, traditionally have been performed by the dentist, if any, could be delegated to auxiliaries. During the past decade several investigations were undertaken to explore the feasibility of the expanded function concept. Programs were established within the Royal Canadian Dental Corps, in England, within the U.S. Navy Dental Corps and within the Division of Indian Health of the U.S. Public Health Service to explore and evaluate a variety of expanded function programs. In addition, from 1964 to 1966 the University of Alabama School of Dentistry conducted a study designed to determine the potential capability of specially trained dental auxiliaries to perform some of the operations traditionally performed only by the dentist. All of these experimental and demonstration programs verified the feasibility of delegating many functions to auxiliaries without affecting quality and still increasing significantly dental productivity.

In 1960, the House of Delegates of the American Dental Association approved a resolution urging dental schools and the Federal Dental Service to undertake careful, designed programs of experimentation and research in the training of dental hygienists and dental assistants. In 1966 a further resolution, which was approved by the House of Delegates, recommended that individual practitioners, acting through their dental societies and dental examining boards, "Proceed promptly with studies, decisions and legislative actions which will help meet the manpower needs of the public, including the identification of additional functions which can be delegated to auxiliary personnel working under the direct supervision of the dentist." In 1967, the ADA recommended that dental societies and dental examining boards support the revision or State Dental Practice Acts to achieve more effective utilization of the services of dental hygienists and dental assistants. A little later in this paper, I'll review with you some of the actions which have been taken by State Boards of Dental Examiners concerning their practice acts and regulations to meet the recommendations of the American Dental Association. But first, I would like to discuss a study which was conducted at the Division of Dental Health's Manpower Development Center located in Louisville, Kentucky.

The Division of Dental Health established a five year program to acquire comprehensive data concerning the quantitative and qualitative effects of assigning expanded chairside duties to specially trained dental assistants. Specific objectives of the study included:

1. The determination of the type of dental procedures that dentists ordinarily do which could be delegated to auxiliaries.

2. The development of a training program to teach these auxiliaries to perform the selected procedures.
3. A determination of which delegated duties could be accomplished by the auxiliary in an amount of time comparable to the dentist's and with comparable quality.
4. A study of changes in productivity by varying the sizes of the dental team.

The first step was the establishment of a base line of proficiency by assessing the performance of dentists working in the conventional manner. Dental assistants were trained for one year in expanded functions and then evaluated in the Louisville clinic. The study clearly demonstrated that dental assistants could be trained successfully in expanded functions. These expanded functions included procedures which normally would account for almost one-half of a dentists chairside time with a patient.

Once these results were quanitified and evaluated, the Center initiated a program to determine how dental productivity would be affected by utilization of expanded function auxiliaries in a variety of dental configurations. Although some problems arose, one fact was quite evident. Dentists could increase their productivity two to three-fold by utilizing expanded function auxiliaries.

Thus, the feasibility of using expanded function auxiliaries was firmly established. The next step was to alleviate the problems involved in the establishment of adequate training programs. Not only must dental auxiliaries be trained in expanded functions, but dentists and dental students must be trained to use these auxiliaries. Instructors in dental schools must be trained in a newer, more advanced program to teach efficient and effective dental auxiliary utilization. Dentists presently in practice also must be trained to utilize expanded function auxiliaries.

State Dental Practice Acts have to be revised to allow dental auxiliaries to perform expanded functions in the dentist's office. The role of other dental auxiliaries such as dental hygienists, dental laboratory technicians, patient management staff and office managers also has to be explored. If we are to meet the challenge of the seventies, serious decisions have to be made in regard to the future position of the dental profession toward the institution of a more complex system of delivering dental health services.

Presently, the Louisville Dental Manpower Center has established a program to train key dental faculty members in implementing team dentistry programs in their dental schools. We have asked the dental schools to work closely with dental auxiliary schools in developing their programs. In order to support the dental schools in these activities, the Division of Dental Health has initiated a grants program. It provides dental schools with funds necessary to establish training programs for dental students, in which they can learn to work with and to supervise a total dental health team that includes various types of auxiliaries trained in carrying out expanded functions.

Once our Louisville Center has completed the dental school faculty training program, tentative plans call for the establishment of a similar program for faculty responsible for dental auxiliary training in Junior

Colleges and technical schools. For current information concerning this program, you should contact your Division of Dental Health Regional Dental Program Director in your HEW Regional Office. He will be able to provide you with information concerning expanded function training activities for your area and also provide you with advice in establishing expanded function programs at your school. I'll be happy to discuss this program with you in more detail during the discussion session later this afternoon.

Finally, I would like to review some activities underway in regard to State Dental Practice Acts. In 1969, the House of Delegates of the American Dental Association approved a resolution creating a dental task force to develop recommendations concerning the Association's position with respect to participation of the dental profession in national programs concerned with the delivery of health care to the public. The task force was assembled and five committees formed for specific areas of study. The Committee on Manpower was given the responsibility for developing estimates with respect to dental auxiliary manpower needs to meet projected increases in demand for dental care. The Committee initially studied dental auxiliary requirements in terms of conventional dental practices. Such practices would not include any expanded functions for dental hygienists or other dental auxiliaries. They concluded that by 1975 there will be 24,500 dental hygienists and 117,700 dental assistants available for a dentist manpower supply of 107,325. They estimated that these figures represent a deficit of nearly 40,000 dentists, 20,000 hygienists and 103,000 dental assistants.[5] This deficit was based upon estimates of the basic demand for dental care in the total population without the enactment of any national health legislation, but with the additional demand created by the establishment of several Federally supported programs which are now available or soon to be available to various segments of our population. By 1980 they estimated that the deficit will increase to nearly 25,000 hygienists and over 180,000 assistants.[5]

Due to this projected deficit in dental manpower, even without the establishment of any sort of National Health Program which includes dental care, the committee then studied the anticipated need for dentists if they were to utilize expanded function auxiliaries. Their figures indicated that the estimated dentist shortage could be decreased by more than 1/3 by 1975, over 1/2 by 1980 and completely eliminated by 1990.[5] Thus, among the committee's recommendations were the following:

1. The profession, through its various agencies, should accelerate as rapidly as possible the training and use of expanded function auxiliary personnel.
2. There should be a program of Federal support for the accelerated development of training programs for expanded function auxiliaries, including construction, operational, and faculty training support.
3. The criteria for accreditation of auxiliary training schools should be revised to permit broader experimentation with curriculums, program content, and length of training.
4. State examining boards should be urged to further revise State Dental Practice Acts and regulations to permit more effective use of expanded function personnel.

5. There should be a moratorium on licensure, registration, or certification of additional types of dental auxiliaries until more definitive information is available about the relative role of the dentist and his expanded function auxiliary.
6. There should be additional emphasis in dental schools on teaching dental students to use auxiliaries, including expanded function auxiliaries, and that Federal support for these activities be continued and expanded.
7. There should be formal programs for continuing education to prepare practicing dentists to use expanded function auxiliaries.
8. There should be formal programs of training in the performance of expanded functions for those auxiliaries presently in the work force.
9. There should be more extensive use of ex-military dental corpsmen in the performance of expanded functions in civilian practice.

Within these recommendations are strong implications for all institutions involved in training dental auxiliaries. In response to this challenge and the need to alleviate the dental disease problems of the people of this country, many dental practice acts now have been revised to allow delegation of additional duties to dental auxiliaries under the supervision of the dentist. There is available, from the Division of Dental Health, a resource book detailing specific provisions of dental practice acts for the 50 States and the District of Columbia. This data is current as of approximately one year ago.

The resource book can be obtained by writing:

National Institutes of Health
Division of Dental Health
Manpower Studies Branch
Bethesda, Maryland 20014

The subject of changing State Dental Practice Acts to allow more permissive legislation concerning the utilization of dental auxiliaries is quite controversial and oftentimes based more upon emotion than logic. Most dentists, unlike many of their medical colleagues, have not been trained to utilize a variety of auxiliaries in providing services, but instead, in some instances, jealously guard their perogatives in regard to the actual delivery of a service to a patient. Added to these facts is the wording of the majority of State Dental Practice Acts which discourages the delegation of duties to auxiliaries. Many State dental laws have specific clauses limiting the duties which an auxiliary can perform even under the direct supervision of a dentist. These limiting clauses make it almost impossible for Boards of Dental Examiners to allow for expanding the functions of auxiliaries. It would be more practical for dental laws to delineate those procedures which an auxiliary must not perform, rather than those which can be delegated. Mr. Bernard Conway, Assistant Secretary for Legal Affairs fo the American Dental Association has suggested that the statutory base of State Dental Practice Acts and the use of Board rules and regulations be combined in such a manner that those procedures involving diagnosis, treatment planning, prescriptions and remedial procedures involving, contributing to, or resulting in an irreversible alteration in the oral anatomy should be limited to dental practitioners alone and that the State Board should have the authority to issue rules or regulations specifying other tasks that a dentist may not delegate to an auxiliary. Mr. Conway further stated that such permissive legislation would benefit the public by increasing dental resources for providing dental care; it would benefit dental auxiliaries by giving them an opportunity to perform more productive and rewarding tasks; it would benefit the dentist, for it would provide him with definitive guidelines in the delegation of duties and it would benefit the Boards of Dental Examiners for it would free them to exercise leadership in developing the dental resources necessary to meet the growing demands and needs of the public for dental care.

Thus, in spite of the sentiments of many and the emotions which are aroused when even discussing the delegation of duties now performed by dentists, progress is being made in many States in regard to legally allowing dental assistants and dental hygiensists to perform expanded duties.

Dental hygienists probably suffer most from the limiting aspects of State Dental Practice Acts. Normal duties for a dental hygienist are usually defined as those which include prophylaxis (scaling and polishing the teeth), topical fluoride application, taking of dental radiographs and charting of existing dental conditions. Anything beyond these procedures in the Practice Act would be defined as an expanded function.

Dental assistants, unlike dental hygienists, are not required to obtain licensure in each State in which they are employed. In fact, very few Dental Practice Acts make any reference to their duties other than those which provide for expanded functions. A Dental Practice Act which would allow a dental assistant to perform clinical procedures other than providing direct chairside assistance to the dentist would be considered one which permits expanded functions.

Using these standards as a guide for dental hygienists and dental assistants, Dental Practice Acts have been changed to provide for the inclusion of expanded functions for dental hygienists and/or dental assistants in 23 States. Of these, eight States have defined permissable expanded functions for both hygienists and assistants, another seven States for assistants alone and four States just for hygienists. Although many States have changed their Practice Acts to allow their State Boards of Dental Examiners to determine what functions can be delegated through the promulgation of rules and regulations, most of these States have moved very slowly in actually allowing for the delegation of very many activities. This slow movement probably is due more to confusion and disagreement among educators and dental leaders concerning the nature and content of expanded function training programs than to a negative attitude toward these concepts on the part of these Boards. The consensus appears to be that expansion of duties is not only desirable but essential. Once a consensus has been reached on the type, degree and extent of training necessary for dental assistants and dental hygienists in expanded functions, there probably will be rapid movement toward establishing more definitive rules and regulations within our States.

Another trend taking place in many States is a movement to abolish the many diverse and oftentimes conflicting licensure Boards and establish a single Board of Licensure under the Governor which would centralize all licensing authority within the State. Such a consolidation and centralizing of licensing authority has not been received enthusiastically by many of the health professionals. They feel that a licensing Board composed of a majority of lay citizens cannot pass adequately upon the qualifications of health professionals desiring to practice within their State. A more logical approach might be some type of consolidation of the various health licensing Boards within the State into a single licensing entity separate from another Board responsible for other licensing activities. Nevertheless, it would appear that any changes in licensing authority within the States would greatly effect dental statutes concerning auxiliary delegation of duties.

In conclusion, we should be aware of the many forces, social, economical and traditional which are involved in the eventual direction which the dental profession will take in order to better serve its clientele. Changes will and are taking place which will have immediate and profound impact upon the nature and direction of your taining programs for dental auxiliaries. If your programs are to remain viable within the context of change and renewal, you must keep abreast of the multitude of new events which will effect the nature of dental practice. If your dental hygiene and dental assistant training programs are to graduate students who will be able to meet the challenges of their profession, you must constantly evaluate your programs with regard to these many changes taking place, both now and in the near future.

BIBLIOGRAPHY

1. Unpublished data, 1964 Work Plans, Dental Programs Branch, Division of Dental Health.

2. Personal communication - American Cancer Society.

3. Cancer of the Mouth - Research Information Branch, National Cancer Institute, Revised 1971.

4. U. S. National Health Survey: Preliminary Report on Disability, United States, July-September 1957. Washington, U S. Department of Health, Education and Welfare, Public Health Service, Division of Public Health Methods, 1958. Public Health Service Publication No. 584-B4, Table 16, p. 21.

5. The Requirements for Dental and Dental Auxiliary Manpower, A.D.A. Task Force Committee Reports - October 1971.

LAW ENFORCEMENT PROGRAMS

DENNY F. PACE
Deputy Regional Administrator
U.S. Department of Justice - LEAA

When one attempts to make a prognosis about the future, it is necessary to understand that the criminal justice system is a tool for the political party in power. Regardless of what idealism one may wish to expound, the fact remains that a bottle of gasoline thrown by a group of radicals, a prison riot, or a bad decision by an appellate court judge has a tendency to alter the course of political decision making. The nature and resulting confusion from these changes dictate that those working within the system must be ready to accommodate such changes. The logical methods of adjusting to these changes is to have personnel with the temperament and the intellect to make these midstream changes. To be capable of making these rapid, and sometimes controversial changes, the entire spectrum of human emotions are involved in the critical decision making. Sometimes it seems these human emotions are no longer capable of dealing with the continuing series of crises in the performance of one's duty. These crises convey to the criminal justice worker a sense of hopelessness in dealing with the irrational behavior of man's nature. The worker must either succumb to this hopelessness or he prepares himself to understand the weaknesses of human nature. When he understands these fundamentals of human existence through quality education and training, he is then prepared to render the best service possible to a community.

I will attempt to outline briefly the direction in which I believe we must proceed in order to arrive at personnel needs in the constantly changing criminal justice system.

For example, let me outline just a few of the new tasks to be performed by police personnel in the decades ahead. These tasks are going to call for new career patterns developed by the colleges and universities throughout the country. Some of the new tasks that will arise in the 1970's and 1980's will be performed by the line officer and will deal with both the social and physical sciences.

The officer must be better versed in functional criminal and constitutional law than the lawyer. He must have the intelligence to make these sciences work in his behalf in his contact with the public. In addition, he is entering an era of scientific technology in field operations that stagger the imagination. For example, he must know when a crime scene investigation requires computer services, infra-red photography, atomic activation analysis, spectographic analysis, and chemical analyses of a hundred varieties. Even more important perhaps, is the education and training necessary to insure an adequate face-to-face contact with the citizen -- Does he know the legal safeguards accorded the citizen in search and seizure laws? Is he sure he is prepared to protect individual rights as well as those of society? The line officer becomes a complex mechanism in this sophisticated society -- and the mechanism is oiled only with quality teaching of both the technical and theoretical varieties.

In other areas of the criminal justice system the same dramatic changes are occurring. In crime prevention, crime causes are being diligently researched and action programs of intense magnitude are being initiated. For example: The Law Enforcement Assistance Administration of the Justice Department has just been brought into ten Regional Federal Councils that will coordinate the effects of seven major funding agencies of the Federal Government. The joint funding of projects will avoid duplication and assist local agencies in having an impact upon weaknesses in the basic social structures. This coordination will carry through to local agencies where crime prevention will become a multi-dimensional effort by the entire resources of a community. Potential delinquents that are identified in school will now receive the benefits of a system that will serve as a treatment referral agency and a job resource.

It appears that emphasis in dealing with an individual after he becomes a subject of criminal investigation is focused upon work orientation and social integration back into a community. For example, probation workers are now attempting to find a job and place the individual upon his own resources - rather than under strict supervision which has doubtful value. Vast new career areas are emerging in these service areas.

The courts are woefully lacking in adequate staff. The judge spends too much time administering and not enough time deciding key legal issues of a case. New careers in court reporting and administration can take the courts into the 20th century. Through electronics and computer record systems such as the Subject in Process the courts are able to render faster more technically adequate decisions.

In the above cited processes an entirely new group of personnel must be educated and trained. Many thousands of para-professionals are going to be required to up-grade the system.

In the post sentencing processes of the criminal justice system, new techniques are demanding new personnel. For example, screening and classification of sentenced prisoners are now keeping the first timers on probation, in half way houses and in on-the-job training activities. Within the institutions great emphasis is being put on "residential type" facilities, community re-acculturation and technical training and education efforts are becoming standard practices. The programs mentioned are going to succeed only if highly qualified persons are available to insure their proper functions.

All agencies of the system are moving to different approaches which in part is spurred by the 800 millions being spent in FY 73 through LEAA.

What is needed in all units of the system is personnel who are visionary in attempting new ideas that are based upon the ability to plan for anticipated needs...not only for today but for ten years into the future. For example, new careers need to be developed in systems and programs planning so that the criminal justice system can through "simulation planning" know whether a project will have any potential for success.

New ways to impart more and more technical information to operating field personnel are needed in light of the tons of information being disseminated. For example, in Beaumont, Texas, a far-sighted chief is now broadcasting new procedures and new laws to the officers while they are on patrol. Information comes to the officers in 1-3 minute broadcasts so as not to conflict with regular radio calls. Many criminal justice training systems are going to more condensed packaged training to insure a compact presentation.

To the delight of those in the criminal justice system who cannot go to school between 9 a.m. and 2 p.m. some schools have even found that they can operate to accommodate the working citizens of a community through night classes - offered in three hour sessions, and some of the more progressive even offer identical and interchangeable classes. To the traditionalists these innovations violate all ideals of education - but they work.

In developing functional training and educational systems, all are not roses. The Criminal Justice System is being bled to a slow death by the "courthouse gang" who have neither the academic qualifications nor native intellect to envision some of the major problems of the future. If the system cannot develop personnel who can throw the rascals out, then we are doomed to decades of mediocrity.

Is it unfair to request units of government to move in new directions, to better utilize semi-professionals in semi-professional jobs? Should it be necessary to plea for the system to better utilize women in the jobs for which they are as equally qualified as men - yet are not hired? It is a shame that the system is attempting to build a career plan - when entire states, dominated by the courthouse bunch, will not acknowledge the benefit of training or education.

Not all of the problems in new innovations in criminal justice education come from outside. Institutional education refuses to budge from the old liberal arts concept of general education, then specialized education at the masters level. That concept is fine except functionalities in the Criminal Justice System rarely get beyond two years of college. Society needs specialized education in the first two years of an educational program, and also at the masters and doctoral level. Maybe we can develop an educational system that is better than the "three door theory" now used to develop our professional teachers. That is the movement from high school - to college - to graduate school - back to school - without any practical understanding of what society really is.

Because our professional educators are victims of the above described theory, we are faced with gross lack of understanding in why technical education courses should transfer to a four year institition and be counted toward a degree.

Finally, one more comment on how I think educational facilities should better be serving the pressing needs of the Criminal Justice System. I believe the facilities of education should also be used for training. The two should be kept administratively separate - but there the fear of pollution should end. With proper design, the institutional learning needs of an individual can be 90 percent satisfied in a college setting. The remaining 10 percent is on-the-job training of routine mechanical functions. As a learning model is established - that is - facts and information - then concepts - then theory - it becomes clear to me that a community college is in a position to upgrade both training and technical education - and plans to see that they are used should be mandated at the state level.

To conclude, let me say the stimulation on new concepts within the Criminal Justice System is not an easy task - but it is a challenging one.

TECHNICIANS FOR ENVIRONMENTAL CONTROL

WALTER J. BROOKING
Program Officer, Technical Education
U.S. Office of Education

Public awareness of the need to improve our environment and conserve our resources is both demonstrated and heightened by the recently enacted Federal, State, and local legislation. There continues to be an urgent call for action and involvement of more of our population and institutions to get on with the business of environmental betterment. One result is a growing conviction that more persons must be prepared for employment in work which improves our environment or conserves our resources.

Another growing need is to provide at least a minimum awareness or "environmental literacy" to all persons in our society to instill in them both a feeling of urgency to protect or improve the environment and the knowledge of how they can help in the course of their daily living. This "environmental literacy" is particularly needed for children in school

More and better programs to prepare skilled workers, technical and supportive specialists, and professional personnel to solve the problems and perform the work which will improve our environment are clearly needed. However, at the outset of any discussion of environmental careed education, it must be observed that the environment is affected by so many complicated factors and is the result of such a variety of applied technology that such education programs must reflect a direct relationship to the recognized technological fields of knowledge and work as they relate to the environment. Further, it is likely that the greatest shortage of manpower in the environmental fields is and will continue to be at the technician and similarly specialized worker level.

Professional engineers and scientists whose work requires specialized preparation to relate to environmental problems can probably be prepared in a year of specialized graduate study, and probably many can prepare themselves by special study on their jobs.

Skilled workmen can generally be instructed in the special skills and knowledge required for some environmental task related to their field of work in a few months to a year of study or on-the-job learning.

Programs to prepare technicians, however, require the longest lead time of all. It takes from four to five years to plan, initiate, enroll the first class and graduate technicians from a new two-year post high school technical program.

At the two-year technician level it is very doubtful that sufficient depth of knowledge and related skills can be taught in a "general environmental technology" to make the graduate employable in any field. Therefore, the career objective for which many persons will prepare themselves at either the technician and supportive level (or even as professionals) to work at improving or conserving our environment will not be called "environmental." Instead, they will relate to some established branch of applied physical, biological, earth, agricultural, medical, or social science.

In the future the education of persons for careers in work to improve our environment and to conserve our natural resources is expected to be an outgrowth of the general awareness education. The "environmental literacy" education may excite some persons to want to prepare for special careers in the environmental field just as general health education courses may stimulate some students to prepare for careers in the health field. Career education for environmental tasks should start in the elementary school, continue through high school, and for many youths and adults extend into the junior colleges, technical institutes, and branches of four-year colleges, which prepare technicians and similar specialists. Obviously for some it will continue through the colleges and universities which prepare the professional leadership in each of the disciplines and fields which have a bearing on environmental matters. A discussion of both general environmental awareness programs in schools and the education of technicians for employment in environmental tasks follows:

GENERAL ENVIRONMENTAL EDUCATION FOR EVERYONE

Under the concept of career education, as it is developing under the leadership of Dr. Sidney P. Marland, U.S. Commissioner of Education, the program will begin as early as kindergarten through revised curriculums that relate reading, writing and arithmetic to the varied ways in which adults earn a living. All of these careers are grouped into families or "clusters" of occupations. Environmental career opportunities is one of the clusters.

As each youngster advances into junior high school, he will select various clusters or broad groupings of related occupations such as manufacturing, marine science occupations, or environment and begin exploring the nature of specific careers in each one. By senior high school, he will concentrate on the group of career opportunities which interests him most and will develop sufficient skill in a specific occupation to qualify for a job.

It is visualized that students will have an opportunity to enjoy actual work experience during their high school years through cooperative arrangements with employers. Yet each student's program will remain flexible enough to enable him to switch to a related occupation later with a minimum of supplementary training. In addition, each student in a career education program will always retain the option of going on to a technical supportive or professional occupational objective beyond high school at whatever stage or time in his employment experience it fits his needs.

The environmental career cluster includes broad headings as follows: soil and mineral conservation and control; space and atmospheric monitoring and control; environmental health services; development and control of physical manmade environment; forest, range, shore and wildlife conservation and control; water resources, development, conservation and control; and all of the logical subheadings involved under each including supportive and professional career opportunities.

The elementary orientation and the prevocational and exploratory informational type of education in the elementary grades and continuing in the junior high grades, 7, 8, and 9, is aimed at providing an elementary literacy and familiarity with the field of environment and ecology which will serve to make the individual an informed person. It may quicken his interest in further pursuing some aspects of environmental education as a career.

This elementary education in environment and ecological information is analagous to the fundamentals of health education, which should provide the individual with the basic information each person needs to maintain his or her health. Similarly all individuals in their enlightened self-interest need to possess elementary literacy regarding environmental and ecological factors that influence their lives and which they in turn may influence as individuals within society.

The organized information regarding environmental and ecological matters which are required to give an individual a reasonable preparation for life as a citizen and consumer must include considerable information about the world in which he lives. It must stress the natural environment as well as manmade environmental factors and institutions which influence environment.

Biological science factors as they control or affect environmental and ecological concerns need to be emphasized in order to provide each individual with a clearer comprehension of how environmental changes affect his health and his style of living. A broader understanding is needed by most people of the fact that man is himself a living organism sharing the world's resources with all other living things in an interrelated community where the tolerable limits and balances for survival are precariously narrow and delicate. Much of man's manipulation of his physical environment, both intentional and inadvertent, has been by the application of what he has discovered in the physical sciences and applied in engineering. It appears that a greater awareness of the basic biological equations in our total environmental concerns will be needed to insure both survival of man and the increased advantages of further applications of modern technology.

In the past five years considerable material has been developed which can assist teachers at all levels, and more is being developed. One example of such material starts in the first grade and proceeds through grade 12. It relates to all of the teachers' subjects, so that environmental and ecological information does not displace but provides an interesting and fresh emphasis and heightened student interest and motivation whether the class deals with history, language, general science, health or social sciences.[1] This is only one of many examples of materials available to teachers to guide them in teaching general environmental and ecological information, concepts and citizen responsibility.

It is expected that general environmental and ecological information should be well absorbed by the junior high school years. Additionally, it is expected that some specific information relating to some occupational opportunity in the environmental cluster may have excited some students' interest to the point that they may want to prepare for a career in the field. While in high school, these students can study the subjects required to prepare themselves to enter and succeed in a post-high school supportive or technician level or professional program of study.

It is also expected that the career education cluster approach will provide better educated youth to enter either professional preparation in a four-year college or the post-high school programs which prepare technicians or similarly specialized personnel.

TECHNICIANS AND EMPLOYMENT OPPORTUNITIES IN ENVIRONMENTAL CONTROL

Since major shortage of personnel appears most likely to develop among technicians and similar supportive persons in the environmental and ecological field when major programs are implemented to control or abate the effects of some disrupting environmental element, let us examine their work and preparation.

---

[1] People and Their Environment, J. G. Ferguson Publishing Company, Chicago, Illinois, 1968.

Technicians are needed in a given field when the work to be done is sufficiently specialized to require the services of professionals who delegate a part of their work to technicians who are competent in the field. The technicians or similar supportive workers must have a general understanding of the work of the professional and must be able to do a part of the work under his supervision, including the supervising of specialized workers in the field.

This means that there exists a corps of specialized professionals in the field and commonly recognized clusters or groups of related employment opportunities for professionals, technicians or similar supportive personnel, and skilled workers.

The specialized fields of applied science which affect our environment and ecology include almost all of the bodies of applied science.

The products of applied physical sciences and engineering such as airplanes, automobiles, computers, automated chemical manufacturing plants and all manner of machines that convert energy and do work, are part of the overall environment. Internal combustion engines which produce chemicals as a by-product of combustion pollute the air. Worn out automobiles clutter the landscape. These all create employment possibilities for technicians in the environmental field.

Biological sciences in the field of agriculture, forestry and oceanography with all of its ramifications of utilizing, culturing, harvesting, conserving and recreationally enjoying natural assets represent another part of the environmental and ecological employment opportunity for technicians and similar specialists.

Biological sciences in the field of health cannot be separately considered from the environment. The conservation of air and water resources and the abatement or prevention of their pollution involve both physical and biological sciences and constitute an important part of the environmental task which lies before the Nation.

Perhaps less well defined but no less real are social problems arising from technological influences which have caused more than three quarters of our population to be centered in urban areas. The problems of man-made housing, transportation, and delivery of all required material and social services represent a major technological challenge. More subtle and perhaps less understood are the effects of increased noise levels and the tensions and other problems which arise from intimate living and crowdedness in our cities, especially when a significant portion of that population has migrated from uncrowded rural areas and must adjust to supporting themselves and living in an urban center.

With such diverse activities directed by professional scientists and practioners in the various technological fields of modern living, it is clear that many of the specialists in the field of environmental control will not be so labeled. To discover whether an individual is working in the environmental field, it will be necessary to take a closer look at his actual functions within his general field. Because of the diversity of technologies that bear on man's environment, it will be impossible to prepare any one technician or professional to be proficient in all fields. The amount of specialized technical knowledge is simple too great for any one individual to master.

Pursuing this premise, a brief analysis of the major fields of environmental control and concern as they may relate to the need to initiate new or enlarged technician programs beyond high school follows:

AIR POLLUTION CONTROL AND ABATEMENT

A small number of two-year programs to prepare air pollution technicians already exists. The experience of these programs indicates that there are growing employment opportunities for well-qualified graduates. It is probable that with the passage of more stringent legislation to control internal combustion engine emissions employment opportunities will increase for specialists who can diagnose and direct the efforts of skilled mechanics in the correction of maladjusted automotive, truck, airplane, or other internal combustion engines.

In light of the progress being made in enforcement of air pollution abatement legislation, it is likely that employment opportunities will increase for graduates of high quality technician programs to be employed by manufacturing establishments or power generating plants to prevent the pollution of air by escaping fumes, poor fuel combustion, excessive dust, or other particulates; or in Federal, State, or local governments to enforce and monitor operations covered under the legislation.

The U.S. Office of Education has undertaken the development of a publication "Air Pollution Technology, A Suggested Two Year Post-High School Curriculum." The contractor and the program model was the Air Pollution Technology Program at Santa Fe Junior College, Gainesville, Florida. The contract for the preparation of the guide is nearly completed. It is believed that there is need for more technicians in this field now, and that this need will be urgent before new programs can begin to graduate technicians.

WATER RESOURCE DEVELOPMENT, CONSERVATION, AND CONTROL

Two-year post-high school programs to prepare water pollution control technicians or water and waste water plant operators have been operative for almost ten years. It appears that more programs are needed because the graduates of some of the present high quality programs do not go to work for water or waste water disposal plants and thereby provide the required operative and managerial staff for the complex plants which are emerging. Instead, they find better employment opportunities with manufacturing concerns, chemical plants, paper mills or other enterprises whose operations might pollute soil or streams and who employ the graduates to help to insure that the company does not violate pollution control regulations. It is evident that more programs to prepare this type of specialized technicians are needed.

SOLID WASTE MANAGEMENT

Solid wastes are very diverse, and management of most of them presents specific, not generalizable, technical challenges. They may involve soil pollution, and need to be examined very carefully by school administrators who might consider establishing a two-year program in the technology of solid-waste disposal. Soil can be polluted or destroyed by accumulated solid waste, erosion, excessive contamination from chemicals, or from the poisoning effects of alkalinity. Well prepared, water pollution control technicians, or agricultural chemical technicians, or even chemical technicians probably would have the required technical background to interest a potential employer with soil pollution problems of this kind.

Most of the solid waste disposal problems will not be solved by individuals labeled "soild waste" disposal experts or technicians. For example, recycling of paper will involve collection of used paper materials and recycling them through a paper plant. The technicians and professional engineers and managers involved in the process will be chemical or industrial process specialists rather than "solid waste" specialists. Similarly the recycling of glass will involve collection of glass containers and other scrap glass and recycling it through a glass factory. Even the operation of a sanitary landfill probably will require a technician who can supervise the processes required to move the earth, deposit the fill, and cover it. The whole operation will follow a plan drawn up and supervised by a sanitary engineer or a civil engineer. The technician's preparation will most likely have been in the civil engineering technology field.

The removal and disposal of worn out automobile bodies, refrigerators, and similar cluttering of the landscape is already being accomplished by collection, mechanical crushing, or shredding and separation and salvage of the resulting materials. These programs are operated by mechanical engineers and industrial production engineers and technicians rather than persons labeled "environmental control" or "solid waste disposal technicians."

The scrap metal salvage businesses which have been in operation for hundreds of years have never been considered "environmental" or "ecological" institutions, but rather a prudent and profitable recycling of valuable resources

The environmental and ecological problems arising from strip or underground mining, the control of the processes to avoid potential chemical contamination of streams from mine waters, waste dumps, ore leachings, or processing materials, and the reforesting or restoring of the land will essentially be solved by civil engineers, mine managers and the related technicians rather than environmental or solid waste disposal technicians.

It is likely that high quality programs in civil engineering technology, highway construction, building construction, mechanical design, industrial production, or chemical technology will be the best preparation for technicians who will be employed in work to control, abate, or prevent much of the pollution of our environment. Hence, the strengthening of such programs or the initiation of new ones might be a much better route toward preparing needed manpower to improve the environment than attempting to establish "environmental technology programs" which are general in nature, shallow in technical content, and of dubious and undemonstrated value as a valid preparation for the work which will be available when graduates of such programs seek employment.

FOREST, RANGE, SHORE AND WILDLIFE CONSERVATION AND CONTROL

Forest technicians who assist foresters in culturing, protecting from disease and fire, harvesting and replanting of the forests may well be considered environmental technicians but not capable of being prepared by a short course or a few hours of exposure to the field. Youths looking for outdoor careers contributing toward environmental control will also find opportunities as wildlife management specialists and technicians and as skilled workers required for the administration of fish and wildlife resources. Park and recreation technical assistants and specialized workers probably will be needed in greater numbers in both the public and the private sector.

The fields mentioned here provide important opportunities for environmental technicians but under completely different names; that of the specialty of the field reflecting the applied science and specialties of the professionals and managers with whom the technicians work.

DEVELOPMENT AND CONTROL OF MAN-MADE PHYSICAL ENVIRONMENT

Structures man builds for his homes and institutions and for transportation and other services are major elements in his environment and exert a tremendous influence on the total environmental and ecological balance of the system within which man lives.

The Nation's new awareness of the need to protect the environmental and ecological balance of the world will probably result in a considerable increase of the number of highly skilled mechanical, civil, architectural and building, electro-mechanical, electro-optical, instrumentation, electronic, computer and other specialized physical science technicians. These personnel will be needed to solve the problems brought about by further applications of scientific principles and in order to maintain a viable living environment and increase the benefits of applied science and technology in the future.

In addition, research and development of more effective accoustical materials and noise abatement methods, better urban planning and development to provide suitable housing, recreation facilities, and all other required services for an increasing population will probably generate employment for a larger number of technicians.

ORNAMENTAL HORTICULTURE

The development of large urban centers and the growing awareness of the need for open spaces in cities will bring into focus the need for ornamental horticultural specialists to beautify and improve urban and suburban land. Ornamental horticulture has been practiced for centuries. Evidentally it has been found that ground which is covered with grass, hedges, trees, and flowers is less likely to be carelessly littered, and certainly will be more pleasant and restful to the eye than unplanted space. The green foliage also contributes toward maintaining the balance of carbon dioxide and oxygen in the atmosphere. More floriculture, turfgrass, arboriculture, nursery management, and landscape development technicians will be needed to meet the employment opportunities for technicians in these fields of work.

COMMUNITY SERVICE

The problems modern man encounters in living with others in his technological society may be considered an important aspect of the environmental and ecological challenges he faces. The social sciences are contributing insights and techniques which must increasingly be a part of the preparation of community service workers. In light of experience in recent years there can be little doubt that the important social services of maintaining law and order, or caring for the health, and welfare of our population, and of providing recreational services and facilities have much to do with the quality of lives of persons living together in today's world.

A growing number of programs to prepare technical assistants who can work with the various professionals in police science and correctional services, social workers, urban planning, recreation and related endeavors doubtless will be needed to lead our people to understand and to live in and improve the environment they inherit.

ENVIRONMENTAL HEALTH AND FOOD INSPECTION

It is likely that many post-secondary community colleges, technical institutes, or division of four-year colleges which have strong biology departments, a nursing program, or perhaps an agricultural program, will find that they already have a part of the staff and facilities required to start programs to meet employment needs in the environmental health, radiological health, food processing control and inspection, rodent and insect control, and related sanitation fields. Such programs can be a natural outgrowth of the staff, facilities, and established capabilities of the institution and are a logical extension in to the environmental education field. It is likely that well-qualified technicians and specialists in these fields will be needed to respond to the requirements of recent legislation and the greater awareness of the need for monitoring and testing of water, food, and food processing and serving establishments, hospitals, and all public and private institutions which house and feed people.

AGRICULTURE AND RELATED TECHNOLOGIES

A major element in the conservation and utilization of soil resources is in the application of modern agricultural science. Modern machinery permits the tilling of the soil by scientific means to avoid serious dust or water erosion of crop land. Modern agricultural methods are restoring land which has reverted to desert by the use of irrigation, landfill, chemicals, and land cover which prevents further wind and water erosion.

Recycling of agricultural wastes and rotation of crops to restore depleted chemicals from farm crop lands are well utilized scientific methods. Continued research and development of more sophisticated specialized processes in all fields of agriculture, however, will require an additional number of specialized technicians to manage the agricultural productive capability of the Nation, to provide the food and fibre required, and to provide the maximum utilization of land resources consistent with a healthy and improving environment for the present and future generations.

The progress that has been made in the development of agricultural chemicals and especially the use of nutrients and growth agents promises important occupational opportunities. The production of food by hydroponic methods, the reclamation of land by soil transplanting, and the application of sepcialized farming science to fish culture and aqua culture are examples of areas where technicians may be needed.

These technicians will influence environment and ecology and in most cases will be specialists in some field related to agriculture rather than environmental technicians.

OCEANOGRAPHIC AND MARINE TECHNOLOGY

The National program for exploration of space in the sixties is well known. Scientific research and development to explore and utilize the oceans and area underlying them represents another major challenge which already requires large numbers of technicians and which increasingly will demand the technical skills and understanding of technicians and similar specialists. Some of these technicians will be involved with engineers and physical scientists in creating a submarine habitat for man, or in learning more about the ocean currents, ocean chemistry, map the ocean floor, etc. The underwater engineering technicians will help to develop structures for underwater habitation. All will influence the oceanic environment.

In the applied biological science realms of oceanographic and marine development, marine life technicians, ocean fish and fisheries technicians, and marine aquaculture technicians will continue to be needed.

Only a few programs exist to educate technicians in any of these fields. Almost all specialties in this category have some scientific knowledge and technical skills in common, but each is sufficiently different to require different technical courses and specialization.

Aquaculture will probably be one of the very important sources of food in the future. Fish culture is already a large industry in inland lakes and waters, but it has not yet begun to be practiced in the ocean estuaries and along the shores as it must be to provide a significant source of food for our growing population. These scientific and technological developments of the future will doubtlessly be intimately dependent on, and exert their own special influence on the environment.

INITIATION OF NEW PROGRAMS TO PREPARE TECHNICIANS FOR ENVIRONMENTAL WORK

There is mounting evidence that more programs to educate technicians will be needed in almost all fields of applied science with impinge on environmental control or improvement.

The decision to start a program to educate any kind of technician or specialist is an important responsibility of the chief administrator of the school and his controlling board. Each technician program requires a separate justification and involves long-term staff and financial commitments which are continuing responsibilities of the institution. No program should be undertaken unless a careful study, made with formal or informal advisory committee support, gives convincing evidence that the technicians are needed and that the need will continue in the foreseeable future. A program should not be started unless there is a good prospect of its being needed for several (perhaps 10) years, with the normal modifications made to meet technological change.

Technician or similar specialist preparatory programs which relate very specifically to a particular environmental concern need to be studied with special care before new ones are launched. The U. S. Office of Education, Division of Vocational and Technical Education, has addressed this special problem by recently having prepared and distributed under contract a publication Aministration Factors and Actions in Initiating Post-High School Environmental Control Technology Programs, A Suggested Guide.[2]

Studies and surveys to determine the need for a particular technician program must usually involve agencies besides the school. Conferences with employers, the Department of Labor, the State Board for Vocational and Technical Education, and other interested State or regional agencies yield important data on the capability of existing programs to meet the needs and help to describe local, State, regional, and the national requirements for the technicians.

To explore existing programs is probably the least expensive and most rewarding approach to the study of a proposed new program. Most institutions with successful or new programs welcome visits by administrators and staff members who plan to start similar programs. Much can be learned about curriculum, cost, staff, facilities, student recruitment, and placement from the experience of others. Such visits provide invaluable opportunity to see laboratories, farm, or clinical facilities, learn details about the program, locate consultants, learn about clinical or field experience arrangements and requirements, and study many more important and pertinent matters.

---

[2] See Payne, Albert V. in the suggested references, page

Experience has demonstrated that no program to educate a new kind of technician or specialist should be undertaken without an exhaustive study of established or experimental programs in the field or a closely related field. It is seldom that a justifiable need to prepare a new kind of specialist is so new or novel that no other institution in the Nation has begun to develop a program to meet that need. One or more prototype or experimental preparatory programs exist for most of the non-baccalaureate career specialists which relate to environmental problems. It is too expensive in time, money, and human effort to rediscover what already has laboriously been learned by those who have well-established or even partially proven programs to prepare new kinds of technicians or specialists. This priceless resource should never be neglected in starting new programs.

SUGGESTED REFERENCES

American Society for Engineering Education. Our Technological Environment: Challenge and Opportunity. Washington, D.C.: The Society, 1971.

Bayliss, Sylvia J. et al. Career Opportunities for Community Service and Related Specialists. Chicago: J. G. Ferguson Publishing Company, 1970.

Brennan, Matthew J. People and Their Environment. Chicago: J. G. Ferguson Publishing Company, 1969.

Brooking, Walter J. Career Opportunities for Engineering Technicians. Chicago: J. G. Ferguson Publishing Company, 1969.

Ferguson, J. G. Publishing Company. Career Opportunities - Ecology, Conservation, and Environmental Control. Chicago: The Company, 1971.

Ferguson Guide to Two-Year College Programs for Technicians and Specialists. Chicago: The Company, 1971.

Concise Handbook of Occupations. Chicago: The Company, 1971.

Hopke, William E. The Encyclopedia of Careers and Vocational Guidance. Chicago: J. G. Ferguson Publishing Company, 1971.

Kissinger, Robert E. Career Opportunities for Health Technicians. Chicago: J. G. Ferguson Publishing Company, 1970.

Payne, Albert V. Administrative Factors and Actions in Initiating Post-High School Environmental Control Technology Programs, A Suggested Guide. Utica, N.Y. Mohawk Valley Community College Faculty Student Association, 1971.

Prakken, Lawrence W. Technician Education Yearbook 1971-1972. Ann Arbor, Michigan: Prakken Publications, Inc., 1971.

Rhine, Shirley H. and Creamer, Daniel. The Technical Manpower Shortage: How Acute? New York: National Industrial Conference Board, 1969.

Sidney, Howard. Career Opportunities for Agriculture, Forest and Oceanographic Technicians. Chicago: J. G. Ferguson Publishing Company, 1970.

Tomlinson, Robert M., et al. Guidelines for Health Occupations Education Programs. Urbana, Illinois: University of Illinois at Urbana, Champaign, College of Education, Department of Vocational and Technical Education, 1971.

United States Department of the Interior. Sport Fishing USA, Washington, D.C. Superintendent of Documents, U.S. Government Printing Office, 1971.

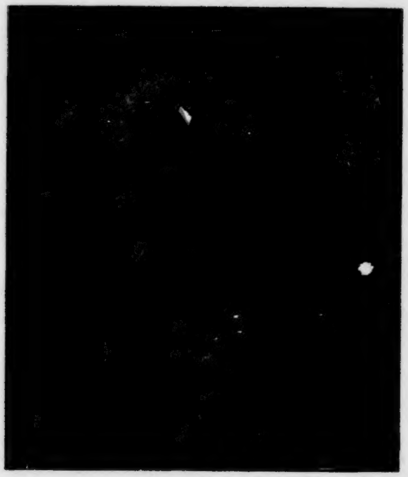
Wiggs, Garland D. Career Opportunities for Marketing, Business and Office Specialists. Chicago: J. G. Ferguson Publishing Company, 1970.

The following selected references prepared and published by the U.S. Department of Health, Education and Welfare, Office of Education, are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 at the following prices:

OE-81015	Agricultural Equipment Technology - A Suggested Two-Year Post High School Curriculum - $1.25
OE-80062	Architectural and Building Technology - A Suggested Two-Year Post High School Curriculum - $1.50
OE-80031	Chemical Technology - A Suggested Two-Year Post High School Curriculum - $.75
OE-80041	Civil Technology - Highway and Structural Options - A Suggested Two-Year Post High School Curriculum - $.60
OE-80056	Criteria for Technician Education - A Suggested Guide - $.45
OE-87045	Diesel Servicing - A Suggested Two-Year Post High School Curriculum - $1.25
OE-80009A	Electronic Technology (Revised) - A Suggested Two-Year Post High School Curriculum - $1.00
OE-10077	Environmental Education, Education That Cannot Wait - $.30
OE-81016	Farm Crop Production Technology - A Suggested Two-Year Post High School Curriculum - $1.50
OE-82016	Food Processing Technology - A Suggested Two-Year Post High School Curriculum - $.50
OE-80054	Forest Technology - A Suggested Two-Year Post High School Curriculum - $1.25
OE-81014	Grain, Feed, Seed, and Farm Supply Technology - A Suggested Two-Year Post High School Curriculum - $1.50
OE-80033	Instrumentation Technology - A Suggested Two-Year Post High School Curriculum - $.75
OE-80019	Mechanical Technology - Design and Production - A Suggested Two-Year Post High School Curriculum - $.70

OE-81012	Metallurgical Technology - A Suggested Two-Year Post High School Curriculum - $1.25
OE-81017	Ornamental Horticultures Technology, Suggested Two-Year Post High School Curriculum - $1.75
OE-80037	Scientific and Technical Societies Pertinent to the Education of Technicians - $.35
OE-80057	Water and Wastewater Technology - A Suggested Two-Year Post High School Curriculum - $1.50 (April 1969)

INDUSTRY SPEAKS OUT



JOHN L. COCKRILL

President

LTV - Ling Altec, Inc.

Good morning ladies and gentlemen. That was a very gracious and painless introduction.

I come to this Clinic on Technical Education feeling somewhat like a fellow named Joe, who was fond of dogs. He was going to a dog show one day when he chanced to meet a lanky countryman leading a motheaten hound on a leash. Joe fell in with him and said, "Are you going to the dog show?" and he said he was. Joe said, "Are you going to take that dog?" and he said he was. "You don't mean you are going to exhibit that dog?" said Joe, and the fellow answered yes again. "Well, you don't expect him to take a prize do you?" said Joe, and the countryman said, "No, I don't expect him to take a prize, but he is going to meet an awful lot of nice dogs."

Obviously, I do not have the effrontery to come here to set you right on anything concerning education in general, or technical education in particular. But I am awfully greatful for the chance to mingle with my betters. I would be stupid if I came here to tell you anything about the technical side of technical education. You know I don't know and I know I don't know, and if I tried it I would run out of answers.

I would be like the gentleman who came to his local school and said, "Isn't it fine to come down here and get educated. To learn that two times two is four, and seven times eight is fifty-six, and nine times twelve is - (pause) - and then there is geography." I would be that way, too, I would run out of answers.

What I would like to do is to point out to you some problem areas as I see them from an industrial viewpoint and suggest some possible opportunities that are opening to you in this period of change and challenge to the American Education System.

The decade of the seventies is already shaping up as one of denunciation and accusation against the American Educational System. The charges range from undermotivation to indoctrination, from lack of discipline to stereotyping. The demand for more effective education and training comes from all sides. It comes from government, which sees it as essential to the sound solution of key social problems. It comes from parents, who count it vital if their hopes for their children are to be fulfilled. It comes from the disadvantage , who claim it as an all-too-often denied right and their most likely means of moving out of the backwaters of our society into its mainstream. It comes from students, quietly or violently, but persistently, because they know it to be a major determinant of their future success or failure. And it comes from business and industry because the product of the educational system all too often is lacking in usable skills.

I recently received a booklet from the U.S. Department of Health, Education, and Welfare - Office of Education, entitled "Career Education." Let me quote from the first page of that booklet.

"The fundamental purpose of education is to prepare the young to live a productive and rewarding life. For, far too many young Americans our schools are failing in this essential mission.

"In typical schools throughout the country young people complain that curriculums are dull and irrelevant, that their education is not opening pathways to a fulfilling adulthood. Substantial numbers of students score below their grade level in basic skills: high dropout rates, absenteeism, academic failure, drug abuse, vandalism, and assaults on administrators, teachers, and pupils signal their discontent.

"It is a rare high school that equips all its students to make the choice upon graduation of entering the job market with a salable skill or of continuing their education. Too often the graduate has neither option, let alone the opportunity to select one or the other.

"Nearly 2.5 million students leave the formal education system of the United States each year without adequate preparation for a career. In 1970, not counting enrollment in homemaking, only about one high school student in six was enrolled in occupational preparation. More persons are graduating from a four-year college with a Bachelors Degree than there are jobs for degree holders. By the end of this decade, eight out of 10 jobs in America will not require a Baccalaureate Degree.

"More appropriate curriculums must be developed, validated, and installed, and they must be used more realistically if we are to meet the needs and desires of students and serve the purposes of society."

Now that is quite a statement of admission coming from the U.S. Office of Education. Do you wonder what stimulated it? I don't know this but I strongly suspect that President Nixon's written message to Congress in his State of the Union Message in January this year may have had something to do with it. President Nixon said:

"Career education is another area of major new emphasis, an emphasis which grows out of my belief that our schools should be doing more to build self-reliance and self-sufficiency, to prepare students for a productive and fulfilling life. Too often, this has not been happening. Too many of our students, from all income groups, have been 'turning off' or 'turning out' on their educational experience. And - whether they drop out of school or proceed on to college - too many young people find themselves unmotivated and ill-equipped for a rewarding social role. Many other Americans, who have already entered the world of work, find that they are dissatisfied with their jobs but feel that it is too late to change directions, that they already are 'locked in.'

"One reason for this situation is the inflexibility of our educational system, including the fact that it so rigidly separates academic and vocational curricula. Too often vocational education is foolishly stigmatized as being less desirable than academic preparation. And too often the academic curriculum offers very little preparation for viable careers. Most students are unable to combine the most valuable features of both vocational and academic education; once they have chosen one curriculum, it is difficult to move to the other.

"The present approach serves the best interests of neither our students nor our society. The unhappy result is high numbers of able people who are unemployed, underemployed, or unhappily employed on the one hand - while many challenging jobs go begging on the other.

"We need a new approach, and I believe the best new approach is to strengthen career education."

What is President Nixon referring to? What does the Office of Education mean in its statement?

Let me touch on the situation as it is today as viewed from the position of business and industry. Let's look at the national picture.

The National Advisory Council on Vocational Education, in its report to the Secretary of Health, Education and Welfare on November 15, 1969, pointed out that in one year the Federal Government allocated 1.6 - billion dollars in support of recruiting, counseling, educating, training, and job placement efforts for approximately one-million Americans who suffered under economic, educational or physical handicaps. Yet, that

1.6-billion dollars did nothing that year to reduce the unemployment rate in poverty areas. As a matter of fact, unemployment has substantially increased since then.

One reason is that in the academic year 1970-71, eight hundred fifty thousand youngsters dropped out of elementary school before graduation. Another seven hundred fifty thousand graduated from high school, and another eight hundred fifty thousand entered college but did not complete the baccalaureate or an organized occupational program. That's nearly 2 1/2 million youngsters in one year without adequate preparation for a career according to the U.S. Office of Education. Many find meaningful jobs, but many of them flow into the pool of unemployed, because the lack the skills, the preparation which would make them readily employable. Whatever their level of education at drop-out time, these youngsters are industrially illiterate. Instead of being an asset to the society which paid its taxes to have them prepared for making a living, many of them become a liability. This increasing pool of unskilled, unemployed and unhappy people is one of the greatest potential threats to our nation.

In effect, we are spending 1.6-billion dollars a year and making no progress toward solving the problem -- because new crops of untrained youngsters come out of school to swell that pool of people who don't have the tools with which to get a job. President Nixon has requested a budget of 2 billion dollars in fiscal 1972 to educate and train these people to help qualify them for employment.

The National Advisory Council for Vocational Education therefore says the Federal Government should invest at least as much money in reducing this flow of untrained youth as it invests in reducing the pool of unemployed. It recommends that this money should be used, not to pay the total cost of industrial arts or vocational or technical skills training --- but just the extra cost over that of our college preparatory courses.

The public should not, of course, overlook the fact that the education system is turning out a high percentage of students who go on to become good members of society. But you can't blame the public for asking how long is the school system going to continue to feed unskilled youngsters into that pool of unemployed? Many of these youngsters can't get jobs. They remain idle. They often turn to crime. They wind up in prison or go on welfare rolls. They soon lose hope, and become a chronic burden on society --- simply because they don't have a skill or the proper motivation to acquire one which will give them a "leg-up" in seeking employment.

At the same time, industry, business, and your neighbors complain that jobs are going begging. There is a shortage of skilled people. It's hard to find people to fix things --- the TV set, the car, the plumbing. People who can build cabinets in the kitchen, or perform other fairly simple tasks, are hard to find and ask premium wages.

I believe that the education system is doing more than is commonly recognized, and great progress has been made in the past few years.

But I don't believe business and industry knows what you are doing. If you want to cooperate with the business-industry community....and I don't believe you will ever succeed without such cooperation...you are going to have to close the information gap and ask for cooperative help. If you ask for help on your basis only, you most likely won't get it. Industry has the general opinion, whether true or not, that the public schools don't or won't....or both....turn out products that industry can use without industry having to train them. This attitude isn't confined to high school graduates -- it included some college graduates, too.

It really isn't important whether this impression in industry is correct or not. The important thing is that generally industry believes it is true and so reacts on that belief.

I was disappointed that, in the statements I have seen by the U.S. Office of Education, I have not been able to find a single reference to the need for public education to cooperate with business and industry in the career education approach. Such cooperation, I believe is essential.

To get what I believe is healthy, helpful cooperation, both the education system and industry and business must come in with a mind open to change. In my opinion, until this happens, the public school system will never reach its potential and its calling --- that of teaching our youngsters how to make a living. And until our public school people...and we as parents...accept the fact that not all of our children are going to go on to college, there will not be a proper emphasis on vocational/technical education and training. We have to get rid of that stigma attached to work with the hands--a stigma which tends to down-grade the dignity of work itself, no matter how skilled. The school system's college prep curriculum belies the preaching and spending of untold funds on the training and manpower programs.... programs to teach and train our disadvantaged, our poor, our unskilled and uneducated citizens. Nearly all these people are products of our public school system to some level.

A recent article appearing in the January, 1972 "Record," a publication of the National Industrial Conference Board, reported on a sampling of some fifty business firms as to their ideas on what, if anything, the surveyed business executive would do with the public education system if he could. Overall, the general sentiment is for changes which will result in more salable skills for the individual and more usable skills for business. When broken down on ideas, there was no concensus of what changes would be recommended. One thing, however, became clear and that is that most responding companies had some provision for remedial basic education -- that is for basic skills such as reading, writing and simple mathematics. All felt an uneasiness about the system and suggested some sort of change.

Many of the criticisms that are leveled at the education system can also be aimed at business and industry for we too are part of the educational process, but we call it training. And what is done in business and industry is critical because in the United States five out of six jobs are in that area. Some eighty-five percent of the employed product of the education system make their living in business and industry.

So what really is wrong with our systems of education and training? What are these criticisms all about?

Careful, objective, practical evaluation of our education and training programs disclose too many facets that raise doubts about three areas -- relevance, timing, and objectives.

By the end of this century, the population of the United States is projected to be about 300 million people. Currently about one-half of our population is under the age of 26, and by the mid 1970's some two thirds to three fourths of our population will be under 35 years of age. The rate of change, the pace of our time continues to accelerate, not only technologically; but also in culture, and education and training must keep pace.

The student query - "What education is relevant to my life ahead?" requires a thoughtful response. Will the traditional answers suffice? We must provide education which is relevant to the world in which they will live. They don't like some of the things they see in our current society. They will be the generation which must correct certain ills and they must be given the tools, through education and training, by which it can be done.

Relevance for the future demands a focus on the individual. Such a focus requires specific knowledge of, and sensitive concern for, the person himself and for the environment in which he does and will live or work. The individually focused effort at education or training has often become so complex administratively that it has failed and has either been abandoned or had its focus shifted back to the process itself. To be relevant to a life of greater and greater ranges of choice, both material and cultural, our education and training must be sharply focused on the individual.

Let me illustrate my point by a story told by Peter Drucker in making his point that the younger generation will no longer accept the system of training and developing managers by spoon-feeding them for three to five years from the mailroom to jobs requiring minimal risks and minor decision making. Peter Drucker tells this little tale:

> "A young man I happen to know was graduated a few years ago from one of our best-known universities with one major in economic history and another in computer programming. A large communications company tried very hard to hire him. The salary offered was most attractive to him - all the more because he had recently been married. He liked the people he met. But he finally turned down the job.
>
> "I would have gone with that communications company," Drucker quotes the young man, "But for the trainee program. When I asked the Personnel Director what I would do the first six months he said, "Don't worry, it's all in the book." When I asked him what I would do the next six months, he said, "Don't worry, the supervisor will tell you." And when I asked him what I would do the second year of the trainee period, he said, "Do? You are not going to do anything. You are going to watch and learn." It was then I decided to turn down the job."

Aren't we educating and training much this way? Don't we say it's "all in the book" or "that is the curriculum" in relation to course requirements. Is it all relevant to the individual? We must not depersonalize our education.

No longer can we proceed with the old assurance the the effectiveness of education or training will last until retirement. In the future, a worker white-collar or blue - may typically expect to learn, gain experience in, and work at two or more proficiencies within his career.

Alvin Toffler, in his book Future Shock says:

> "Today, change is so swift and relentless in the techno-societies that yesterday's truths suddenly become today's fictions, and the most highly skilled and intelligent members of society admit difficulty in keeping up with the deluge of new knowledge - even in extremely narrow fields."

What we shall need is a highly individualized means for mature people to learn a new occupation to replace the one that currently requires their full effort but will disappear before they retire. The task of retiming our whole system of education and training is a formidable one. We must rise above convenience and precedent and find ways to integrate learning with doing, to interweave study and practice, to make education and training a continuing, or at least a recurring, part of living and working.

What we need is some new, cooperative linkage between education and work. It is quite likely to be off-campus, and most of it individualized. We simply shall not have the time to interrupt learning for working nor working for learning; we shall more and more need them not in tandem, but in parallel. Already functioning are a variety of work-study programs, extension programs and campus-oriented, closed circuit TV workplace instruction programs. Education and business and industry must form a partnership in education and training; each establishing in its own areas the climate for work and the climate for education and training respectively.

We must also look at and improve upon the timing problem of when to educate or train, and for what. The academic world has sought better forecasts of the types and numbers of occupationally skilled people needed. At the same time, the business world has been pressing -- either directly or perhaps more powerfully through the indirect avenues of its recruiting, its financial support, or its participation in conferences and courses -- for increases in the supply of skills for various occupations. The same comment could equally apply to the Government, the health institutions, and even the schools themselves. The whole process is almost a cast study in supply and demand - but not quite. Unlike most goods and services, the output of the educational institution has a very long use-life. Thus we are becoming increasingly aware that we are compounding our timing faults. We see the pendulum swing from under-production to over-production and back again gaining alarmingly both in rate and amplitude.

We need to work diligently to develop better prediction models... unless we improve our own forecasting ability we shall be subjecting ourselves to a roller coaster future not only costly and otherwise unrewarding, but cruelly disappointing to our students. Better forecasts in the framework of the complexity and fast pace we expect in the future will probably indicate short-term variations in subjects required and number of students per subject, so, again, the focus must increasingly be on the individual.

The primary objective of any education or training is a better life. It is to help the individual discover, develop, and utilize his highest capabilities. It is to equip him to live with himself and with others. One problem in objectives for education may be the emphasis on scholarship. There are many ways and many things to learn, not just the way the scholar learns. There is need for know-how in a whole galaxy of occupations, not just pure knowledge. Unfortunately, we have so concentrated on getting into college and having a college degree -- on elitism -- that we are sowing the seeds of disillusionment and making "drop-out" an acceptable term.

The error in our thinking is that we have made our objective the education process itself. It is imperative that we reorder our objective making it the preparation of the individual for a sound, self-fulfilling, positive life, in no matter what area of activity. Only when we are focused on preparing the individual for improved performance and personal career development will the results be sound, because only then will he have the interest in the improvement or change of skill that makes him more productive and self-fulfilling.

At the opening of my talk, I quoted from President Nixon and also from a booklet issued by the U. S. Office of Education. Those quotations stated the problem facing education today. I have tried to expand on those problems and to suggest potential areas of concentration for possible solutions as seen from my vantage point as a member of the business community.

In closing I would like to quote Dr. Marland, U. S. Commissioner of Education, who, in speaking before the Annual Conventions of the American Vocational Association in Portland, Oregon, in reiterating his support for career education said:

"I do not speak of career education solely in the sense of job training, as important as it is. I prefer instead to use career in a much broader connotation -- as a stream of continued growth and progress. Career in that sense strongly implies that education can be made to serve all the needs of an American -- teaching, to begin with, the skills and refinements of the workaday world, for if we cannot at the minimum prepare a man or woman to earn a living, our efforts are without worth. But career education must go beyond occupational skills -- the interpersonal and organizational understanding without which one simply cannot exist in a modern nation-state, addressing effectively the matter of living itself, touching on all its pragmatic, theoretical, and moral aspects. That is what I mean in the broadest sense by career education -- and that is the way in which I envision the learning process being carried forward in the schools of this nation, in its homes and businesses and government offices, and perhaps its streets, since for some, much of what is really educational occurs there.

"I speak as commissioner for the first time to the men and women whose enthusiastic support -- or lack of it -- will mean success or failure for the somewhat matured but still very fluid career education reform movement. If the idea is to take off, then this is the time and the place to begin the ascent. Whatever the eventual accomplishments recorded in the name of career education, however successful we eventually are in correcting the present disparity between the technological society and a whole system of anachronistic public institutions, the plain fact is that the career education movement must start in the schools and it must be built upon your record of accomplishment in training high school graduates for the world of work.

"For the facts are...that vocational education has never enjoyed greater prestige within the Office of Education than it does now at this moment under the capable leadership of Dr. Worthington.

"Moreover....what I have tried to indicate to you this evening is that career education is not a major OE priority in name only, a paper goal: career education is the major objective of the Office of Education at this moment in time and will remain so for the foreseeable future."

The challenge to you, as leaders in technical education, is that you will be responsible for the technical education of individuals needed to fill 25% of the jobs available in the United States in 1980.

The climate is improving; the funds are becoming more available; the support for your task seems assured. We in business and industry rely heavily upon you. We would like to cooperate with you. Your opportunities are legion. Your success is up to you.

Thank you for your attention.

ACCOUNTABILITY IN TECHNICAL EDUCATION

EDWIN L. KURTH
Professor of Education
Auburn University

To many it may seem that everything that needs to be said about the subject of accountability has already been written, spoken, seminared, used as conference and convention themes, and publication headlines for journals, magazines and newspapers. Besides, haven't vocational and technical education always been accountable for preparing people for competent performance on the job, and been responsible for placing on jobs all who come through our programs who had employment as their objective? I am certain most of you here would agree though that much more needs to be done; that accountability is both fundamental and complex; that it is an idea whose time has come; and that any program which admits to a 50% or more non completion rate of its initial enrollees is not being fully accountable. So this is our topic for this part of the program.

Accountability became the watchword in education after President Nixon used it in his 1970 education message as a new concept and goal for teachers and administrators. Although the concept has been around for a long time, it has not been applied to education. It can be applied to what an individual does or the activities of a department, a division or an institution. To some who got this from the PPBS concepts, program, planning and budgeting systems, it suggests finances and budgeting. The cost/benefit elements were part of the planning process and not part of the evaluation. It included efficiency in allocation or resources and effectiveness of results of instruction as part of the responsibilities of administrators. To others it means better instruction and student performance.

Most of the definitions, and there are about as many as there have been writers, refer back to either to Webster's dictionary which states that it "is the condition of being accountable, liable, or responsible;" or to Leon Lessinger[6] who while Associate Commissioner of Education probably did more than anyone else to promote the concept and its application to education. Lessinger defines it as "the process designed to insure that any individual can determine for himself if the schools are producing the results promised." The results parents, taxpayers and students want is improved teaching performance and student performance. The schools, teachers and administrators are now being charged with the responsibility. This is a shift from the time when students were held responsible for their lack of performance. But more on this later.

I would like to consider further the complexity of accountability in technical education. It is complex because technical education is associated with or a part of the whole field of technology, of science and engineering from whence it grew. In some ways, I suppose this could be called the macro image of technology and technical education which people hold.

As a part of this image, technology and technical education to many people is either Prometheus unbound or Pandora unboxed. The Prometheus image is held by the entrepreneurs-business and industry producers and consumers, scientists and technologists who believe technology has answers to or can find the answers to many of the problems of society even though misuses of the results may be the cause of many of our ills. On the other hand, the Pandora box image is the image held by an increasing number of ecologists, environmentalists, conservationists and groups of sincerely concerned citizens. The first group firmly believe that technology is and can be the servant of man and society. The second group think man and/or society is already the slave of technology and unless drastic efforts, immediate and continuing, are taken technology will be out of control and will destroy mankind and the world as we know it today.

Charles Reich in his widely read book, The Greening of America, develops a logical premise and has many pertinent points for those who believe technology is a Prometheus unbound, that Consciousness III can make life on this planet possible and worth living. Likewise, Alvin

Toffler, in his book Future Shock, gives succinct views on the status quo (the helluva mess we're in now) as a result of technology and the tremendous challenges and changes man and society must successfully meet if we are going to have a world fit to live in. Both volumes are must reading for everyone who is a participant with any agency, enterprise or activity related to or a part of Toffler's super-industrialist culture. Or, who adhere to Reich's belief in the dominance of human values over technology.

Other macro manifestations of accountability were evident in the deliberations of national and international groups during the past several years. The Education Commission of the States meeting in Denver in July of 1970, and which was composed of governors and legislators from all states, confronted the issue with concern. Their conclusion was that if public education could not respond to demands for improved performance by teachers and students with a system of criteria and procedures for better results then surely alternative education systems would emerge. In August of the same year the International Association of Universities reflected that as education budgets increase they generate more pressure for accountability regardless of the country of level of education.

Accountability is a major issue with many organizations.

Now to turn to the fundamentals of accountability and technical education.

The fundamental or micro part of our consideration of the topic is to take a close and perhaps critical look at some of the basic beliefs that society has held for a long time and which may have a relationship to the 50% drop-out rates we have in our technical education programs.

Society and too many educators have long adhered to the belief that people have a predetermined capacity for learning usually defined by I.Q., intelligence quotients. Because of this we have expected an increasing number of students to fail as they climbed the educational ladder. We have used the normal curve to eliminate students at every level of education. We have subscribed to Darwinism -- that in the educational jungle only the fittest survive. Until recently this belief in an individual having a limited and predetermined capacity to learn (educational determinism), precluded the idea of accountability for learning.If the capacity to learn is determined by divine will or the chance of heredity then educators could not be accountable for something over which they had no control. It seems that many in technical education subscribe to this.

This belief in educational determinism, however, is being discarded by an increasing number of people in education, as well as by business, industry, and the general public. Research has revealed that we tend to apply the "Pygmalion effect;" and which is part of educational determinism is seeing what we expect to see, or failing students who are expected to fail when we are informed in advance of student lack of learning abilities or low verbal intelligence quotients. And we have provided few alternatives on the educational ladder. Even in vocational technical education, the careers, the clusters, the lattice concepts of occupational development are new or unused. Unused especially by those who survived the jungle and are products of the ladder route and are now in decision making posts. This could include many of us here today. However, among many noted educators and many learned people outside the field of education there is a growing consensus that almost all students can learn if a variety of instructional approaches are available and if sufficient time is allowed each student. No longer is wide spread student failure and attrition acceptable.

Manifestations of this unacceptability of student failure is reflected in the many innovations and/or experiments with performance contracting, the voucher system of guaranteeing improved student performance as a result of teaching, or the salary rewards given for achieving specific results from students. All of these efforts require carefully defined goals, well organized processes and adequate resources for achieving goals, and measurement and evaluation of results according to the goals established. Many people in education and also people outside of education say these are no more than common sense (effective) ways of relating resources and efforts to results in ways that are useful for policy making, decisions about resource allocations and rewards or compensation. These could be and should be done in every school system.

All of the above are consistent with the usual major premises about accountability -- what results are we getting and what are we using for measurements to evaluate our results or products. In my review of the literature virtually every writer concentrated on results products or output with little or no attention to the processes or the input, yet any system analyst or management expert will quickly say that if results are not satisfactory or goals not met then we must look at the process and the input material to the system if we want to improve the product.

To me the central premise of accountability in technical education has to include the student who enrolls in the program and remain accountable for those who drop out. Georgia is holding its vocational high schools and area schools accountable for decreasing the drop outs of the disadvantaged by an interlocking academic vocational curriculum which must decrease drop outs and increase enrollments in order to qualify for continued funding. This central, premise includes recognition of the shift of responsibility, from the student to the program or the institution as we move away from Darwinism and educational determinism or the system. This is appropriate. Campbell (1) in his discussion of accountability holds that an accountability arrangement in education without the learner is not only inadvisable -- it is impossible. If the technical education program as a part of our system of education in post high school institutions is to be accountable for the students, we must look at the input, the student selection process before we can expect changes in the output or the products resulting from the process. I am assuming that the competence level for employability , the criteria for measuring results, has been worked out between industry and education with appropriate advisory committees.

My concept of what the student admission process should be like is represented by this flow chart. (See Figure 1) It follows the student all the way through the process to placement on the job or further education.

The selection process must start long before registration day. If we hold to the competency levels industry has set for job entry then we are obligated to students to inform them about technical occupations as early as the middle schools and junior high schools, followed by exploratory or pre-technical experiences at the senior high level. Because the preparation process is usually two years in length for technicians and there are few or no options after the student is admitted then individual and group guidance, testing, interviews and even developmental studies are a must in the selection and admission process. The walk-in student, the adult, the transfer and part-time student must all have access to as much information as possible about the program and job requirements as well as the other options and opportunities.

There is one more accountability premise which I feel we must include. This one is reflected in my open curriculum chart and would apply to the post high school technical clusters processes of the flow chart. (See Figure 2) Because of the rapid changes in the job picture for technicians, employers also have a share in accountability to both education and their future employees, the student. Employers and technical educators have a share in defining and designing the options which must be available to students in technical as well as vocation education. This must include flexibility in initial placement, upgrading and advancement as interests and needs develop with no penalties for leaving the program or reentering.

Ever since the invention of the Carnegie Unit, our educational system has been more or less geared to the concept that educational accomplishments and job competencies and skills could all be developed in the same length of time regardless of the ability or aptitude differences of the individuals enrolled. So in most educational programs we have held time as a constant and let the competency levels vary. No differences have been allowed whether in education or engineering, medicine, or mechanics, we have said that preparation must be two years, four years, or seven years regardless of the aptitude of the learner or the vocational goal of the learner. If the competency level required was not met in the prescribed time the learner was washed out of the program.

Fortunately, the Manpower programs and the Educational Systems for the 70's experiments have demonstrated that it is possible to vary the time for individuals to reach predetermined performance goals and career objectives and students can learn more and faster if methods and techniques are varied. Even the highly organized medical profession is studying its curricula to make similar changes. The related accountability question of how long does a job preparation program need to be?, has a valid answer. The answer is "As long as it takes for the individual to reach his objective or the competency level which will get him a job?" The answer is the same for "How long should a post-high school education be?"

As a result of what has been learned about teaching and acquiring skills, it is possible for any eligible person to start an occupational preparation program any Monday morning, progress at his own rate toward an immediate or long range objective, exit with no loss of credit, re-enter with no penalty and progress toward the next objective as long as he needs and can profit from instruction.

When we have so organized and structured technical education we will satisfy both macro and micro complex and fundamental concerns for accountability and indeed be Prometheus unbound and not a Pandora unboxed.

FLOW CHART FOR TECHNICAL EDUCATION POST HIGH SCHOOL

CAREER PLANNING, ENROLLMENT & PLACEMENT

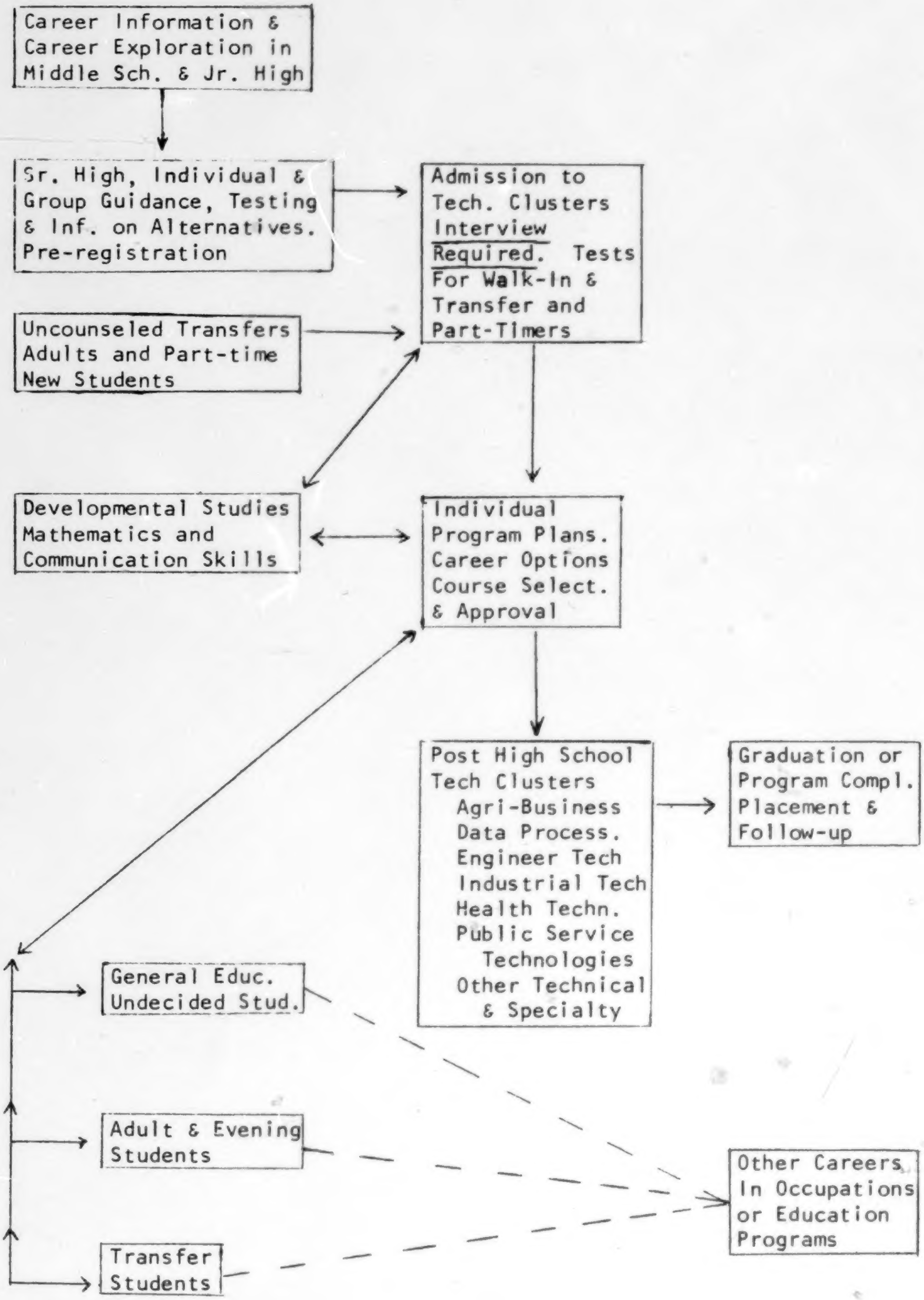

Career Information & Career Exploration in Middle Sch. & Jr. High
Sr. High, Individual & Group Guidance, Testing & Inf. on Alternatives. Pre-registration
Admission to Tech. Clusters Interview Required. Tests For Walk-In & Transfer and Part-Timers
Uncounseled Transfers Adults and Part-time New Students
Developmental Studies Mathematics and Communication Skills
Individual Program Plans. Career Options Course Select. & Approval
Post High School Tech Clusters
Agri-Business
Data Process.
Engineer Tech
Industrial Tech
Health Techn.
Public Service Technologies
Other Technical & Specialty
Graduation or Program Compl. Placement & Follow-up
General Educ. Undecided Stud.
Adult & Evening Students
Transfer Students
Other Careers In Occupations or Education Programs

Figure 1

JOB PREPARATION PROCESS CHART

COMPETENCY LEVELS HELD CONSTANT

PREPARATION TIME VARIES WITH INDIVIDUAL NEEDS

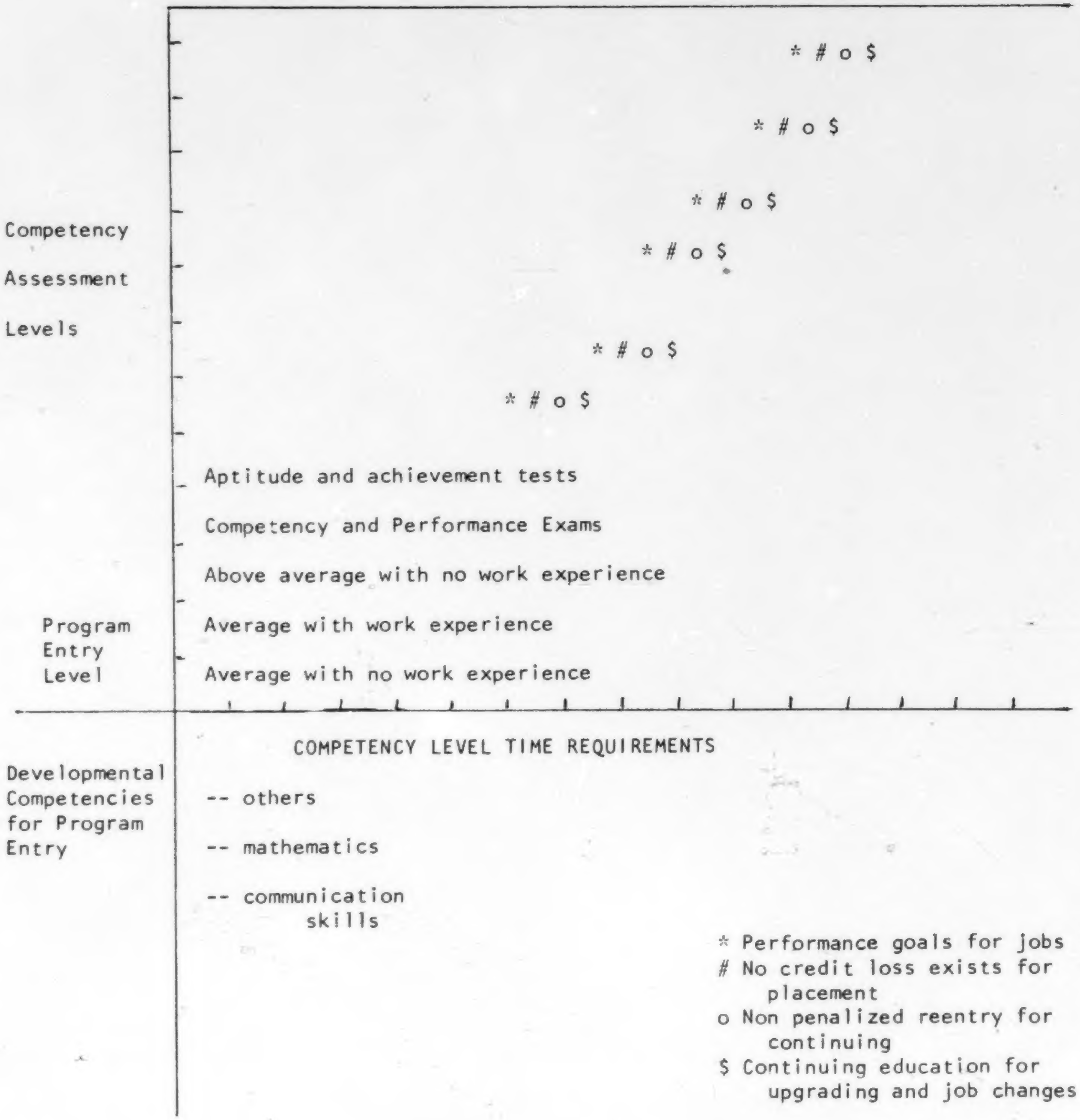


Figure 2

RESOURCES

Campbell, R. E. "Accountability and Stone Soup," Phi Delta Kappan, November, 1971, LII, pp. 166-178.

Cass, J. "Accountable to whom? for what?" Saturday Review, Vol. 54, March 20, 1971, p. 41.

English, F. and J. Zaharis. "Are Accountability and Governance Compatible?" Phi Delta Kappan, Vol. 52, February, 1971, pp. 374-375.

Jordan, B. "Educational Accountability: A Crucial Question," Junior College Journal, Vol. 41, March, 1971, pp. 23-25.

Kowash, R. J. "What is Performance Contracting?" Pennsylvania School Journal, Vol. 119, November, 1970, pp. 139+.

Lessinger, Leon. "Accountability in Public Education," Todays Education, Vol. 59, No. 5, May, 1970, pp. 52-53.

Lieberman, M. "Overview of Accountability: Symposium; Education," Phi Delta Kappan, Vol. 52, December, 1970, pp. 194-239.

Morris, J. E. "Accountability; Watchword for the Seventies," Clearing House, Vol. 45, February, 1971, pp.323-328.

Niblock, J. "Accountability at Work in Two Southern Community Colleges," College and University Journal, Vol. 10, January, 1971, pp. 23-24.

School Administration Opinion Poll. "Large Majority Favors Teacher Accountability," Nations Schools, Vol. 86, December, 1970, p. 33.

Schare, A. "Accountability and Evaluation Design for Occupational Education," Education Technology, Vol. 11, March, 1971, pp. 26-37.

Wilson, D. F. and J. Stocker. "Accountability and the Classroom Teacher," Todays Education, Vol. 10, March, 1971, pp. 41-56.

ACCREDITATION AND TECHNICAL EDUCATION

BARRY L. MELLINGER
Associate Executive Secretary
Southern Association of Colleges
and Schools

It is indeed a pleasure to have the opportunity of sharing some of my thoughts and experiences with this group regarding accreditation and technical education. I have attended this clinic regularly for several years and count it an honor to have been asked to speak to this group. This annual clinic has been very valuable to technical education personnel, through providing an opportunity to exchange ideas, discuss major issues, and to identify solutions to common problems. I certainly hope this meeting can be continued in the years ahead.

I have been asked to address my comments to the topic, "Accreditation and Technical Education." This is an almost impossible task in the 22 minutes allotted, However, I will try to touch on a few key points which perhaps we can expand more during our discussion period later.

Most groups I speak to include three types of people: (1) those who understand accreditation; (2) those who do not understand accreditation; and (3) those who misunderstand accreditation. It is quite difficult to discuss accreditation without boring a few people, being too general for some, and confusing still others. The controversy which currently surrounds accreditation usually provides for lively discussion and again, perhaps during our group discussion, additional questions or further clarifications can be made.

At the outset, I must reveal my personal philosophy. I am an educator, a vocational-technical educator, and an accreditor, in that order. I am firmly committed to the philosophy and purposes of career oriented education. I also firmly believe in the concept and practice of voluntary accreditation for education generally, and for vocational-technical education specifically. I am directly engaged in the process of accreditation because it has, is, and will continue to play an important role in the promotion of high quality vocational-technical education. While very committed to the major strengths of accreditation, I also recognize some of its shortcomings and limitations. It has been my objective to capitalize on the strengths of accreditation, as they relate to vocational-technical education, but also to work toward improvement of its weaknesses. Many changes and improvements have already been made, more are currently taking place, and continued progress will be made to most effectively adopt the process of voluntary accreditation to the entire field of career oriented education.

I will attempt to identify: (1) pertinent characteristics of both accreditation and technical education; (2) some of the current issues; and (3) some of the efforts which have and are being made to enhance the accreditation process as it relates to technical education.

THE PROCESS OF VOLUNTARY ACCREDITATION

It is essential for this discussion that a few characteristics of voluntary accreditation be identified.

Accreditation in this country is voluntary. Voluntary in the sense that it is nongovernmental and is conducted by the educational profession. Voluntary accreditation is the primary, though not exclusive, element of quality control in education.

Accreditation, as currently structured is basically of two types: (1) institutional and (2) specialized. Institutional, or general accreditation is concerned with the totality of an institution, while specialized accreditation is concerned with specific programs or educational components within educational institutions.

Accrediting agencies derive their influence from the recognition they obtain. The value of the recognition provided by an accrediting agency, is largely dependent upon the respect and recognition it has developed, and not from legal or governmental powers. Many would disagree with this statement since eligibility for funding is often associated with accredited status.

Accreditation is based upon the concept of "peer control." In effect, accreditation indicates "peer" acceptance of the level of quality of an institution or program.

Accreditation must be based on an evaluation of an institution's own stated purpose. Given the broad diversity of purpose in education, accreditation must avoid prescribing an institution's purpose, if this diversity is to continue. This is not to say, however, that an institution should be allowed to have a purpose unacceptable to a particular accrediting agency from which it seeks recognition.

A distinction must be made between the terms "accreditation" and "evaluation." It is impossible to have meaningful accreditation without evaluation, but it is not essential that accreditation (or formal recognition) be an outcome of evaluation. Too often these terms are used synonymously. Care must also be used not to confuse the terms "licensure," "certification," and perhaps even "approval" with accreditation.

Finally, accreditation must be based on the maintenance of minimum standards, and not standards of excellence. However, accreditation should also promote excellence, though perhaps as a secondary function. A different emphasis should be placed on the granting of accredited status (primarily meeting minimum standards) than on continuation of accredited status (primarily the promotion of quality beyond minimum standards.) This statement should generate considerable discussion later.

TECHNICAL EDUCATION

Though certainly nothing new to this group, I will identify a few characteristics of technical education which must be considered in the discussion of this topic. Additional ones will perhaps be brought out in our discussion later.

I suspect there are almost as many definitions of technical education as there are people in this room. Great variations exist in the field when specific characteristics of technical education are considered. For example, there is considerable disagreement among technical educators regarding the need, type, and amount of general education for technical curricula. Variations of opinion regarding level of instruction, qualifications of instructors, organizational schemes, and even the scope of technical offerings also illustrate the lack of complete concensus within the field.

Generally, however, and recognizing the danger of generalizations, I believe we would agree that technical education is concerned with the educational preparation or upgrading of persons to enter or progress in an occupation or cluster of related occupations at levels of performance between the skilled worker and the professional in numerous occupational fields; engineering, health, business, agriculture, distribution, etc. Beyond such a general definition, however, considerable differences are apparent. The continuum between the skilled worker and the professional is becoming increasingly larger, and new levels of technical occupations are emerging (the bachelor's degree in technology is one educational response to this change). As the range of technical occupations has expanded, the education of technical personnel has become even more diversified. This increasing diversity, in turn, promotes increasing variation of opinion within the field of technical education. It has become increasingly difficult for those outside the field to understand basic criterion of high quality technical education programs.

Generally, technical education curricula are approximately two years in length and are "terminal" in nature in that they are not designed primarily for transfer into baccalaureate degree programs. However, considering the "career ladder" concept, and the rapid increase in baccalaureate-degree programs in technology, transferability of technical education credits is becoming a recognized purpose of technical education, as well as immediate employment upon graduation. The full impact of this change has not been felt in our field.

Technical education is found in a variety of institutional settings including:

1. Comprehensive high schools;
2. technical high schools;
3. post-secondary non-degree granting area vocational institutions;
4. post-secondary degree-granting technical institutes;
5. comprehensive community colleges; and
6. four-year colleges and universities.

A different approach employing one or more of these types of institutions is found in practically each state. When discussing the topic "Accreditation and Technical Education," it is imperative that the complexities presented by these differences of approach be recognized.

Methodology is perhaps the area of greatest commonality within the field of technical education, though many variations exist here also. It is possible, however, to identify many common methodological characteristics (though the names vary) of various approaches in technical education. Such things as rather specific objectives related to actual practice in the occupational area, a significant degree of practical as well as theoretical instruction, a paramount emphasis on the development of saleable skills and knowledge of graduates, and the use of lay advisory committees represent a few basic principles common to most effective technical education programs.

ACCREDITATION AND TECHNICAL EDUCATION

With this background, let us now turn directly to the topic "Accreditation and Technical Education."

Consideration of a basic question preface consideration of basic issues. Why is there a need for accreditation in technical education? Several factors include the following:

1. The process of accreditation can promote educational improvement of technical education through required self evaluation and external "peer" evaluation;

2. Accreditation can establish a commonly accepted minimum level of quality in technical education. However, it does not necessarily follow that accreditation results in "standardization" and uniformity among all technical education programs;

3. Accreditation can provide a mechanism for recognition of technical education programs which meet minimum standards of quality. Such recognition is helpful to prospective students, graduates, employers, parents, other educational institutions, and the general public;

4. When appropriate, and I emphasize appropriate, accreditation can facilitate not guarantee, transfer of credits among institutions, in some cases upward but also horizontally among technical education programs;

5. Accreditation can provide a means of providing some self-confidence that a program is functioning at a level of acceptable quality within the educational world, and finally;

6. Accreditation can and is contributing to the development of appropriate esteem for technical education within the educational world. Accreditation can, if properly structured and conducted, assist in making technical education an integral part of the total education enterprize.

I will attempt to identify and briefly discuss several issues which currently exist in accreditation and technical education.

STANDARDS Perhaps the most controversial issue is that of Standards, or evaluative criteria for accreditation of technical education. There are a number of aspects of this question which must be considered.

A major problem is one of semantics. Indicators of quality are variously labeled by such terms as standards, evaluative criteria, guidelines, guides, characteristics of excellence, and essentials. There is also considerable disagreement concerning what the nature of these indicators of quality should be. Should they be of such a nature that they are scientifically and objectively measurable, and therefore, quite quantitative, or should they be qualitative in nature thereby requiring greater subjectivity and less precise measurement in their application? Most of us would agree that evaluative criteria must be qualitative in nature and consequently flexible in their application (though less reliable) if standardization and uniformity are not to result.

There is much discussion of the appropriate focus of evaluation. Elaborate evaluation models have been developed incorporating varying degrees of emphasis on input, process, and output variables. Many argue that evaluation in accreditation should be concerned only with output or product variables. While evaluation of the product of technical education must be an integral and important emphasis in accreditation, evaluation of process variables such as financial resources, methods of instruction, organization, faculty, and physical facilities are equally important if remedial efforts are to be made for improvement of the product. If one purpose of accreditation is to improve technical education, then ways must be found to improve the process upon which the end product is dependent. Much research and experimentation is needed, however, in order to identify the most valid and appropriate indicators of quality in education generally and technical education specifically.

If voluntary accreditation is truly a process of "peer" evaluation and recognition, then the development of standards must be the result of participatory efforts of the peer group and not entirely outsiders. Accreditation standards used for technical education, therefore, should be developed with the assistance of technical educators. First, however, persons and points of view which truly represent the concepts and practices of technical education must be identified. As I have previously indicated, this is no simple task in a field characterized by the diversity found in technical education.

Finally, I think the standards used for evaluation and accreditation of technical education should and can effectively be an integral part of the standards used for any type of educational program or institution. The basic principles of sound educational practice apply to all education, including vocational and technical education. This generalization is dependent, however, upon the nature of the standards and their application. In short, if standards are expressed as broad principles of educational practice, and they are applied by knowledgeable professionals, they can be quite effective and appropriate for all types of educational endeavors. To develop separate standards for technical education accentuates the problem we all want to solve, that of truly making technical education an integral part of the total educational system at all levels. (Incidently, separate standards for technical education which have been developed, if they are carefully studied and if they are appropriately non-restrictive in nature, in substance have not differed greatly from the standards commonly used in "academic" education.

I wish I had time to pursue the issue of "standards for technical education accreditation" further, but it alone is a very complex topic.

EVALUATIVE TECHNIQUES Another broad category which has elicited much discussion is how evaluation of technical education should be accomplished. This issue also has many ramifications which represent major topics in themselves. I will very briefly mention only a few.

There is general support of the two major evaluative techniques currently used in accreditation; self-evaluation and on-site evaluation by "peer" educators. Beyond this point, however, there is considerable disagreement of specific procedures. A required self-evaluation, characterized by such descriptors as comprehensive, indepth, analytical, critical, and broad involvement, is the heart of the accreditation process. Optimum use of self-evaluation alone in accreditation would greatly promote high quality technical education. Accrediting agencies should and could provide better services to institutions by assisting them more in conducting "effective" self-evaluation.

The on-site peer evaluation should and usually does follow self-evaluation. A major function of this on-site visit should be an evaluation of the effectiveness of the institution's own self-evaluation. John Coster has said that accredication should, in part, serve as a monitoring device in a total evaluation model. This monitoring should include an evaluation of the effectiveness of an institution's own self-evaluation.

There is merit in obtaining the "more objective" and discerning opinions of outsiders. An outside viewpoint can be most valuable in solutions to elusive and perplexing internal problems. Accreditation, through proper use of onsite peer evaluation, can make a valuable contribution to the improvement of technical education.

Should accreditation emphasize institutional or program evaluation? This question has prompted long and heated discussions. My answer is "yes." Accreditation, whether institutional or specialized, must include both levels of evaluation, to some extent. It is impossible to effectively evaluate an educational institution without an evaluation of its educational programs. Conversely, it is impossible to effectively evaluate an individual technical program without assessment of certain institutional characteristics, elements of the environment within which individual programs operate. Organizational and financial factors, for example, play an extremely crucial role in the continued conduct of effective technical education curricula.

Both elements, institutional characteristics and individual programs, are relatively easy to assess in self-evaluation. However, from a practical standpoint, it is perhaps easier to evaluate general institutional characteristics than individual programs using the techniques of the visiting evaluation committee. A team of a few specialists in such areas as financial affairs, organization and administration, student services, and educational learning resources can, in a remarkably short period of time, render an effective evaluation of these areas. However, evaluation of individual programs is a different matter. In comprehensive institutions, with large numbers of individual technical curricula, many persons are required for equivalent specialization. In order to keep costs and productivity at a feasible level, it is virtually impossible to include a specialist on a team for each technical program offered. A solution is a combination of including a specialist on the team for "clusters" of related career curricula, and greater focus on the indirect evaluation of institutional procedures and processes which have proven to be effective in successful technical education programs. An example might be the effective use of lay advisory committees in curriculum development.

A related factor is the selection and assignment of appropriately qualified persons for evaluation committees. These individuals must be carefully selected in terms of their occupational expertise and their professional ability. In effect, a visiting team should be carefully tailored for each situation.

ACCREDITATION PROCEDURES AND PRACTICES There has been much discussion of accreditation procedures and practices regarding technical education. Very generally, I would summarize my opinions of this issue with the following statements. The procedures used for accreditation of technical education need not differ significantly from those for other types of education. Decisions regarding accreditation status for technical education, in part but not exclusively, should directly involve competent technical education personnel if it is to be truly "peer" accreditation.

Accreditation of technical education should be an integral part of the total process of accreditation. A separate agency for this purpose serves only to separate technical education from the total educational program. In addition, given the institutional setting within which most technical education functions, separate accreditation is likely to be much less effective in the promotion of improvement. Those of you in comprehensive institutions who have experienced specialized accreditation recognize the limitations presented. The impact of a recommendation of an institutional accrediting agency is usually much greater than that of a specialized agency.

ACCREDITATION IN PERSPECTIVE The current emphasis on "accountability," the emphasis placed upon evaluation by recent federal legislation for vocational-technical education, and the revolt of the taxpayer, have resulted in unrealistic expectations of accreditation. Many feel that accreditation holds the answer to the mandates presented by these developments. I disagree. Accreditation is not a panacea for meeting these challenges, though it has an important role to play. What this role should be, is a question which needs considerably more discussion and research. For example, accreditation alone cannot provide the evaluation required by the Vocational Education Acts. I hope we will have time to further discuss this particular point later.

CURRENT EFFORTS TO IMPROVE ACCREDITATION AS RELATED TO TECHNICAL EDUCATION

GENERAL All accrediting agencies, regional and specialized, are now giving greater attention to their procedures related to technical education. One does not attend a meeting of accreditors today without hearing constructive and positive discussion of this topic. Sincere efforts are being made by accrediting agencies to give appropriate attention to the area of vocational-technical education.

Tremendous improvements have been made in the coordinaton of institutional and specialized accrediting agencies Joint visitations, the generalist procedure, and modification of required reports to reduce duplication, provide examples.

The reorganized and strengthened Federation of Regional Accrediting Commissions of Higher Education (FRACHE) has given high priority to the study of this entire area. I predict an outcome will be increased similarity of approaches among the regional agencies and more effective evaluation of technical education by all of the regional agencies.

A proposed merger of the FRACHE and the National Commission on Accrediting (NCA) (which is concerned primarily with specialized accreditation) offers greater likelihood of a national (not governmental) system of voluntary accreditation. This possibility includes many possible implications for accreditation of technical education.

SOUTHERN ASSOCIATION OF COLLEGES AND SCHOOLS The Southern Association now has three commissions which relate to institutions offering technical education; the Commission on Secondary Education, the Commission on Occupational Education Institutions, and the Commission on Colleges. In the Southern region, all institutions which offer technical education may become regionally accredited if requirements are met. We believe, we have the most effective structure possible in the Southern Association of Colleges and Schools to provide regional accreditation for the types of institutions in this region.

Professional staff with backgrounds in vocational-technical education have been employed by the Association to provide leadership in this area. Large numbers of representatives of vocational-technical education have been utilized in the development of standards and procedures for accreditation and evaluation of technical education. Many of you have participated. Similarly, an increasingly large number of vocational-technical representatives are now actively and directly involved in the process of accreditation; members of visiting teams, membership on decision making committees, and special committees for revision of standards and procedures. This is true to some extent for all three of the Commissions in the Association which deal with institutions which offer technical education.

There are 29 post-secondary non-degree granting institutions of post-secondary occupational education and 30 two-year associate-degree granting technical institutes presently accredited by the Southern Association of Colleges and Schools. With only one exception, all of these have been accredited since 1966. An additional 116 institutions hold preaccredited status and are actively working toward accrediation.

During our discussion, I will be pleased to indicate a number of additional steps which our Association has taken to increase its effectiveness in working with vocational-technical education.

CONCLUSION Great strides have been made by existing accrediting agencies in their treatment of technical education, though much yet remains to be accomplished. It is incumbent upon us as technical educators to recognize the complexity of the issues involved, and lend our constructive support to finding solutions to the problems which remain.

DEVELOPMENT OF HUMAN POTENTIAL - A NATIONAL RESPONSIBILITY

JIM WRIGHT

U.S. Representative, Texas

I guess you know now why I came. I didn't come for the purpose of making a speech; I came for the purpose of hearing myself introduced by Joe Rushing. That's why I came. Particularly Joe, am I grateful for your telling these people about how young I use to be. I think it's true of most of us as was once said, "That there are only two kinds of people in the whole world who appreciate flattery -- men and women."

Particularly, I suppose, I might concede on St. Patrick's Day that it is unusually true of those who are blessed or cursed, as the case may be, with a bit of the "Irish Blood." One of my friends from New York was telling me recently about three of New York's finest members of the city's Police Department, Irishmen all, who were sitting, talking, and dreaming one day on the street corner, as Irish will want to do. One of them, out of the clear blue sky, said, "Sheriff, I'd like to be famous.

I would like to be so prominent and so well known that I could walk down 5th Avenue and all the people would recognize me from my picture in the paper. They would shout at me and say, 'Hey Mike, how are you?' That's how famous I would like to be." One of the others said, "Oh, I suppose it would be all right to be famous in a small way like that, but let me tell you what I've always wanted to do. I always wanted to be able to go to Washington, D.C. and go to the Whitehouse. I would knock at the door of the Whitehouse and the President, himself, would come and see me standing there. I would be so prominent and well known that the President would put his arm about me and say, 'Well Pat, I haven't seen you in three or four days, won't you come in and have some dinner with me?' That's how famous I want to be." O'Reilly said. "Oh, I suppose it would be all right to be famous in a small way like that so you could walk down 5th Avenue and be recognized from your picture in the paper or you could go to the Whitehouse and the President would ask you to dine with him. Let me tell you what I always wanted to do. I've always wanted to be able to go to Rome and go to the Vatican. His holiness, the Pope, would come and see me standing there. I would be so prominent and so well known that his holiness would ask me to sit in a chair beside him as he gave his message to the people. All the people passing by would see me, O'Reilly, sitting there beside the Pope and would nudge one another saying, 'Who is that man sitting up there beside O'Reilly?' That's how famous I would like to be."

I learned a long time ago not to take too seriously these generous things people say to introduce you. That's their job. They are suppose to say nice things about you. For those of us, particularly in the public service, who begin to take to heart these compliments usually are riding for a pretty big fall.

When I was in the State Legislature, there was an episode I recall where an old gentlemen from central Texas, an auctioneer by trade, was testifying for the Highways and Roads Committee and because he was an auctioneer, we called him Colonel. I don't know in how many of your areas they follow this practice, but it's a mark of veneration and respect to call a fellow Colonel because he's an auctioneer. For those who were friendly to his point of view, in an effort to enhance his prestige and build him up in the eyes of the committee, we would refer to him as Colonel. He was handling himself very well, until one of the members on the other side of the ideological aisle in an effort, I think, to embarrass the old gentlemen and discredit his testimony said, "Colonel, I just have one question. Were you a Colonel in the 1st World War or the 2nd World War?" The gentleman squared his shoulders and looked at him and said, "Young man, I suppose I should explain it to you. You see that Colonel in front of my name, it's just exactly like that Honorable in front of your name -- don't mean a 'damn' thing."

I should say to you that I don't really have any great credentials to appear before this group. I have not made any great innovative changes in the technical education laws. The best I have been able to do is to be one vote for it. That's about it. I will continue to do that because I believe in it. Maybe it's appropriate and right at such a gathering as this "Conference on Technical Education" who should have somebody in my business. You and I are in the same business, the business of democracy.

M. B. Lamar, an early president of the Republic of Texas, stated something which is emblazon upon the University of Texas town when he said, "The cultivated mind is the guardian genius of democracy." Newsweek magazine each week says the same thing, "A well informed public is America's greatest security." Nearly the same promise is in the assurance of the Holy Scriptures, "Who shall know the truth." Education and democracy are so inseparably intertwined, inextricability lenghted together that one cannot advance without the other. If that was true always, I think it's doubly true when we realize that both education and democracy face an entirely new and unprecedent set of challenges.

One of those I might regard to be the fantastic compression of time which has shrunk the planet earth and made the world, whether we like it or not, a neighborhood. Today Fort Worth, Texas, for purposes of transportation or communication either, is a lot closer to London, Paris, Moscow, Saigon than it was 100 years ago to our own state capital at Austin. You can communicate with someone much more rapidly in almost any capital in the world. You can get there faster, if you have to, than our ancestors could have traversed the distance between here and our own state capital. This places upon education and democracy an entirely new dimension of challenges.

Do our decisions have to be right the first time? So the game of politics, if you will, and I mean that in its purest sense, the science and art of government no longer can be played at the pace of a game of chess, nor can international diplomacy with each move and counter-move painstakingly thought well out in advance. It assumes the pace of table tennis where there is no margin for error.

If I were to enumerate another challenge, I think I should say the reality of our time is the explosion of knowledge. Some have called it the way in which science and technology speed ahead at such a blinding pace that they threaten to leave our human art of governing our relationships among men and women far behind. There have been more new scientific discoveries, as you are so well aware, in the last 25 years than in the previous 250 years. Two and one half centuries prior to that many of the scientists report that 95% of the drugs commonly prescribed by physicians were not even known at the end of World War II.

In this changing age with its changing demand on technology and training, the average industrial worker in the United States must change jobs some 15 times in the course of his career and must be retrained 3 times. We have in the aerospace centers, of which Fort Worth-Dallas is one, an entirely new phenomenon strange to our experience with people of highly qualified educational backgrounds out of work. People with doctor degrees in aero dynamics and the related sciences are drawing umemployment compensation. I could cite you one instance here in Fort Worth of such a person delivering newspapers, but what do we do as a nation to cope with these dramatic changes. Looking back upon our history, we have done well. We have made more scientific, cultural, and social progress in our economic problems in a shorter period of time than any other nation in the human race.

Sometimes I talk to kids and throw out a statistic to them. Let's be accurate. The Office of Education estimates that this year of those who would be of age to finish 4 years of college 22% will do so in June. What does that statistic say to you? How do you react to it? Everything is relative. I might look at this statistic and say, "That's pretty good." You know how old I am, Joe told you. When I was in college, it wasn't 22% but 4 1/2% of my age group, my contemporaries, who finished 4 years of college. Five times better, not bad in one generation. I don't suppose this surprizes you because you work with these young people every day.

To discover the typical reaction of a young person, the college age student today, when confronted with that particular statistic does not say how great, rather you mean 76% don't get to finish college. In a country as rich as this we ought to do better than that. Both are right. You'd be right; I'd be right. Looking back to see how far we have come, they're right and looking ahead to see how far we have yet to go. Let's face it, we haven't solved all of our problems. Let's be honest enough to admit we have been slow to make the dream of truly equal educational opportunity for all Americans a reality.

Let's see how far we have come in just a few years. About 12 years ago, again according to statistics provided by the Office of Education, only 34% of the non-white Americans finished high school. This year it will be 72%, not good enough but better than twice as good as it was one short decade ago, flicker of an eyelid in the view of history. The number of minority group Americans who have been able to qualify themselves for today and serve in executive, administrative or professional capacities is four times what it was 10 years ago. No nation, no civilization ever has made such dramatic progress in so short a period of time, but the challenges move ahead faster than our progress sometimes. I hear some talk a great deal of their concern about what we do for the gifted youngster. You should be concerned. You should stretch his capacities and challenge them to give him every opportunity to develop his own potential to the fullest, to the maximum. However, in our zeal to protect the gifted youngster and to create the kind of intellectual and educational elete every nation has to have, we certainly should be socially retrogressive if we would deny or delegate in any sense the responsibility that we have to the less than gifted youngster.

The whole concept of democracy, the whole concept of a society that we have set out to create rests upon two things -- both quality and equality. It rests upon quality and quantity. Sometime back an educator wrote in a national magazine under the title 'Most Every Child Goes to College,' "Perhaps every child must not go to college. I think that's retrogressive thinking. I think it's a darn shame that kids in their junior year in high school have to write to 5 different colleges hoping one will accept them. I don't believe this country ever set out to create a system in which education was a 'sellers market.' I think we set out to create a society that would guarantee to the humblest child of this land, whatever the circumstances, however modest his birth, whatever his color, or his race, or his religion, or his background, the absolute certainty that he will have the opportunity to develop his own potential to the maximum. Also, there will be a place in this society, a place for respectability and contribution of descency for every American. I believe this as an oracle of faith."

I believe that's what you are dedicated to doing. The rapid growth of the community college movement in this country, the growth of technical education, the growing recognition throughout the nation that the first thing you have to do if you are going to equalize educational opportunity is to give people the right to a marketable skill, all points in that direction.

Some years ago, I voted for a bill that said "open housing." What good is that? How good is it for me to come back and say, "Look how great and nonprejudiced a man I am. I voted that anyone who wants to buy a house in Westover Hills, I don't care who he is, can do it." Baloney, he sure can't do it. He can't do it if he doesn't have the money. He doesn't have the money to do it unless he has the job that pays the money to do it. He doesn't have the job that pays him the money to do it unless he has a marketable skill, that starts it.

So, I salute you for what you are doing, congratulate you on your labors to date, and challenge you to stretch them to the utmost because it is a vest that the future of American will be made. Upon this future, America depends. You, so far as I can tell, are the primary vestal of promise that every American, however modest the circumstances, will have as his birthright, the right to a place in this society, honor, respectability, descency, constructive contributions and that it will continue to be in a society which was in Lincoln's day the last vast hope of the earth.

APPENDICES

Appendix A

AMERICAN TECHNICAL EDUCATION ASSOCIATION, INC.

Minutes of Business Meeting

Thursday, March 16, 1972
Fort Worth, Texas

I. The Meeting was called to order by President George Mehallis.

II. It was moved, seconded and approved that the minutes of the A.T.E.A. Meeting for 1971 be accepted as printed. They were sent to all members.

III. The membership Report was presented by Executive Secretary, William N. Fenninger. It was noted that on March 14th the total was:

1280	individuals	-	410 were new members
235	institutional	-	69 were new members
30	industrial	-	4 were new members

A year end report will be forwarded to all members.

IV. The Treasurer's Report was presented by William Fenninger. An annual financial report will be forwarded to all members. Arrangements have been completed to pay IAVE magazine $3.50 per member. This debit account has been paid.

On February 10th a checking account was opened at the National Commercial Bank and Trust Company, Albany, New York, Delmar Branch

Deposit of $11,502.00 was completed,
An amount of $8,029.85 was deposited in a savings account providing 5% interest or over $400.00 per year of income.

Additional details will be forwarded at a later date.

V. George Parkinson reported concerning the changed bylaws. They are briefly noted:

A. Membership dues begin upon receipt of same in the A.T.E.A. offices.

B. Officers shall be the President, President elect, Vice President in accordance with the charter and shall be elected by the trustees. The executive director, formerly executive secretary shall be appointed to serve at the pleasure of the board as an ex officio member without vote and shall not be required to be a trustee.

C. The foregoing officers, the chairman of the regional representatives and the executive director shall constitute the executive committee.

E. Nomination of trustees and regional representatives for unorganized regions shall be completed by mail ballot. This provides a voice by all the membership.

Regions may elect and organize their own regional activities.

It was noted that the Treasurer's Office was eliminated as being separate from the Executive Director.

Vacancies on Board of Trustees and regions not having representatives shall be filled by mail ballot election after nomination committee is appointed 3 months prior to annual meeting.

Trustees must meet twice each year, usually at AVA Convention and National Clinic.

VI. Dr. Ruth Midjaas provided report of nominating committee. Beginning July 1 trustees will be elected by mail ballot and for a 3 year staggered term.

See attached sheet.

Nominations were opened for further candidates.

Nominations were closed.

A motion was made to cast a unanimous ballot for selection of the slate of regional representatives for approval. The secretary was requested to cast one ballot for approval slate of regional representatives. The regional representatives approved were:

Northwestern - George M. Shaw
Pacific - David Taxis
Southwestern - E. R. Billings

After discussion it was agreed to mail the revised bylaws to all members.

A membership supplement is to be mailed at a later date.

A discussion related to communication between regional organizations and national office followed.

VII. A report by Jerry Dobrovolny discussed the increased visibility of the technical education section in IAVE. Greater visibility will be provided through a news column, a summary of the National Clinic in the May issue and activities of regional organizations if forwarded four months in advance.

Additional articles are needed and will be reviewed by Howard Smith, IAVE, Jerry Dobrovolny or Maurice Roney.

VIII. Introductory remarks were provided by President Elect Lloyd Phipps. He stated that the first concern of A.T.E.A. should be to serve technical education as a national organization. Future plans should be considered to eliminate organizational problems and provide definite directions for future conventions.

Since membership is increasing, the quality of service to members must also be considered.

Potential members are great in number and should be solicited.

The newsletter as an organizational voice must continue to recognize regional and national concerns. Regional organizations must improve their activities and provide input to the national organization. The National Clinic should also be considered as an activity of greater potential and planned accordingly.

The technical education program of AVA should also be assisted as a service by A.T.E.A.

The policy as established in Albuquerque "Defining the Technician as a level of education and type of technician should be re-emphasized. In closing it is my belief that the fulfillment of these objectives can only be accomplished by improving communication among all representatives of A.T.E.A."

IX. It was announced that the 1973 National Clinic would be held in Milwaukee at the Red Carpet Inn (March 28, 29, 30, 1973). The Milwaukee Area Technical College (MATC) will host the clinic. Mr. Clem Wisch is program chairman. His address is MATC, 1015 N. Sixth Street, Milwaukee, Wisconsin 53140.

It was proposed that the 1974 clinic be held in Greenville, South Carolina. George Goldsmith on behalf of the Greenville Technical Education Center extended the invitation for the 1974 clinic.

It was announced that a Southeast regional meeting was to be held in Atlanta, Georgia. Planning for the Fall Regional Meeting in Atlanta is to be formulated by Robert Ferguson and Thomas Strickland. The dates are October 19, 20, 1972.

Jack Tompkins provided a report of the Council of Regional Representatives. Arnold Potthast was appointed Chairman and Barry Ballard, Vice-Chairman. The report is hereby printed as received.

MEETING OF REGIONAL REPRESENTATIVES

March 15, 1972
5:00 P.M.

Elected: Mr. Arnold Potthast as Chairman
Mr. Barry Ballard as Vice-Chairman

The Regional Representatives voted to recommend:

1. A specific meeting time be scheduled in the program for regional meetings at each national meeting (AVA, National Clinic). The regional representative will conduct the meeting for the purpose of organizing the years activities and getting input for agenda items scheduled for Board of Trustees Meeting. Board Meetings should be scheduled after the regional meetings.

2. Chairman of Regional Representatives will prepare guidelines for holding regional meetings and will serve as a resource person for organizing and conducting these meetings.

3. We adopt as a policy the goal of rotating the national clinic to each region. The regional representative will be responsible for suggesting the city in his region as a site for the meeting. The Trustees can then consider these recommendations along with other criteria for selection of the site. A longer range site selection schedule should be developed. The site for next two years might be firm and for the succeeding three years tentative pending the regions meeting certain criteria.

Submitted by
Jack E. Tompkins
Retiring Chairman
Regional Representatives

Arnold Potthast suggested that membership might be improved by holding a national clinic in regions where membership is low. He suggested Denver as a future site.

Mr. Clem Wisch commented about the Milwaukee Clinic in 1973.

Motion for adjournment was accepted and approved by voice at 11:58 a.m., Thursday, March 16, 1972.

Respectfully submitted,
Stanley B. Patterson
Recorder and
Associate Executive Secretary

Nominating Committee - Ruth Midjaas, Chairman
Clinton Tatsch, Barry Ballard

Nominations - Trustees

George Parkinson - (Central)
(nominated for re-election)
Milwaukee Technical College
Milwaukee, Wisconsin

Mary Ellis, Director
Washington Office
Technical Education Research Center

Mr. Harry Bigelow
Argonne National Laboratory
(Executive Assistant)
Argonne, Illinois

Donald Phillips (Plains)
Teacher Education
Oklahoma State University

Leon Hardison, Division Head
Related Studies, State Technical
Institute at Memphis, Tennessee

Fred Brinkman - (Pacific)
President, Los Angeles Trade
Technical College
Los Angeles, California

Ruth Midjaas - nominated and
elected by trustees
Consultant, Vocational Education
Oakland Schools, Pontiac, Michigan

Others Recommended -- These are not members of ATEA, hence could not be elected.
Miss Jean Kintgen (Health)
Mr. Joseph Maneri (Business)
Gerald Bekkar (Northwestern)
William Korizek (Northwestern)

Nominations - Officers

President - Lloyd Phipps (automatic)
Chairman, Dept. of Vocational &
Technical Education
University of Illinois
Urbana, Illinois

President Elect - Jack Tompkins
Texas State Technical Institute
Waco, Texas

Vice President - Frank Sheehan
Dean, School of Technology
St. Clair College
Windsor, Ontario, Canada

Vice President - Present trustees are eligible

Nominations - Regional Representatives

Northwestern
George Merrill Shaw
Head, Industrial Technology Dept.
Utah State University
Logan, Utah

Pacific
Dr. David Taxis
Vocational Education Administrator
Los Angeles County
California

Southwestern
E. R. Billings
Texas State Technical Institute
James Connally Campus
Waco, Texas

Appendix B

The Program

NATIONAL CLINIC ON TECHNICAL EDUCATION

sponsored by

United States Office of Education
and
American Technical Education Association

Hosted by

Southwestern Region of
American Technical Education Association

March 15, 16, 17, 1972

Sheraton Hotel
Fort Worth, Texas

THEME: "TECHNICAL EDUCATION - CAREERS UNLIMITED"

WEDNESDAY, MARCH 15, 1972

9:00 a.m.-10:00 a.m. Registration

10:00 a.m.-11:30 a.m. FIRST GENERAL SESSION

Presiding:
Walter Brooking, Program Sepcialist
Div. of Vocational & Technical Edu.
U. S. Office of Education
Washington, D. C.

Recorder:
W. G. Cummens, Senior Program Officer
Office of Education
Region VI
Dallas, Texas

Welcome:
M. A. Browning, Director
Adult, Vocational & Technical Education
Office of Education
Region VI
Dallas, Texas

Introduced by: John Guemple
Associate Commissioner for
Occupational Education & Technology
Texas Education Agency
Austin, Texas

SUBJECT I

Address:
"Technical Education-Careers Unlimited"
Robert M. Worthington
Assistant Commissioner
Adult, Vocational, & Technical Edu.
U.S. Office of Education
Washington, D. C.

Introduced by: Walter Brooking

11:30 a.m.-1:00 p.m. LUNCH ON YOUR OWN

1:00 p.m.-3:00 p.m. SECOND GENERAL SESSION

Presiding:	Lloyd J. Phipps, Chairman Dept. of Vocational & Technical Edu. University of Illinois Urbana, Illinois President-Elect ATEA
Recorder:	Arden L. Pratt, Dean Vocational-Technical Institute Southern Illinois University Carbondale, Illinois
SUBJECT II	
Address:	"Articulating Career Programs-Secondary/Post-Secondary" Theodore A. Koschler, Vice President Miami-Dade Junior College Miami, Florida
SUBJECT III	
Address:	"Articulating Career Programs-School/Community" Jimmie C. Styles, Vice Chancellor for Research & Development Tarrant County Junior College Fort Worth, Texas
SUBJECT IV	
Address:	"Articulating Career Programs-Health Agencies/School" Roger Smith, Vice President Tulsa Junior College Tulsa, Oklahoma
3:00 p.m.-3:30 p.m.	COFFEE BREAK
3:30 p.m.-5:00 p.m.	DISCUSSION GROUPS SUBJECT II SUBJECT III SUBJECT IV
5:00 p.m.-8:30 p.m.	VISIT EXHIBITS

THURSDAY, MARCH 16, 1972

9:00 a.m.-10:30 a.m.	THIRD GENERAL SESSION
Presiding:	Arthur Lee Hardwick Assistant Commissioner Office of Education Region VI Dallas, Texas
Recorder:	Arthur J. Detrie, State Supervisor Technical Education Capital Station Baton Rouge, Louisiana
SUBJECT V	
Address:	"Professional Development for Technical Education Personnel" Jerry Dobrovolny, Head Dept. of General Engineering University of Illinois Urbana, Illinois
SUBJECT VI	
Address:	"New Materials for Technical Teachers" Maurice Roney, Executive Vice President Texas State Technical Institute James Connally Campus Waco, Texas
SUBJECT VII	
Address:	"Technical Education for the Disadvantaged" Reby Cary, Associate Dean of Student Life University of Texas at Arlington Arlington, Texas
10:30 a.m.-12:00 noon	COFFEE BREAK VISIT EXHIBITS ATEA BUSINESS MEETING
12:00 noon-1:30 p.m.	LUNCH ON YOUR OWN

1:30 p.m.-3:00 p.m.	FOURTH GENERAL SESSION
Presiding:	Henry E. Chitsey, Director Program Development Tarrant County Junior College Fort Worth, Texas
Recorder:	Mr. Bill Stanley Director Delta Vocational School Marked Tree, Arkansas
SUBJECT VIII	
Address:	"Administration of Dental Programs at the Post-Secondary Level" Thomas A. McDermott, Regional Dental Program Director Bureau of Health Manpower Education Dallas, Texas
SUBJECT IX	
Address:	"Law Enforcement Programs" Denny Pace, Deputy Regional Administrator U.S. Dept. of Justice-LEAA Dallas, Texas
SUBJECT X	
Address:	"Technicians for Environmental Control" Walter Brooking, Program Specialist Div. of Vocational & Technical Edu. U. S. Office of Education Washington, D. C.
3:00 p.m.-3:30 p.m.	COFFEE BREAK
3:30 p.m.-4:30 p.m.	DISCUSSION GROUPS
	SUBJECT VIII SUBJECT IX SUBJECT X
4:30 p.m.-8:30 p.m.	VISIT EXHIBITS

FRIDAY, MARCH 17, 1972

9:00 a.m.-10:15 a.m.	FIFTH GENERAL SESSION
Presiding:	James W. Haynie, Assistant Director Division of Post Secondary Occupational Education & Technology Texas Education Agency Austin, Texas
Recorder:	Roland A. H. Benson, Chief Consultant Division of Post Secondary Occupational Education & Technology Texas Education Agency Austin, Texas
SUBJECT XI	
Address:	"Industry Speaks Out" John L. Cockrell, President LTV - Ling Altec, Inc. Richardson, Texas
SUBJECT XII	
Address:	"Accountability in Technical Education" Edwin L. Kurth, Professor School of Education Auburn University Auburn, Alabama
SUBJECT XIII	
Address:	"Accreditation & Technical Education" Barry L. Mellinger, Assistant Executive Secretary Southern Association of Colleges and Schools Atlanta, Georgia
10:15 a.m.-10:45 a.m.	COFFEE BREAK
10:45 a.m.-12:00 noon	GROUP DISCUSSIONS
	SUBJECT XI SUBJECT XII SUBJECT XIII

12:00 noon-1:45 p.m.	SIXTH GENERAL SESSION LUNCHEON MEETING
Presiding:	George Mehallis, Director Technical/Vocational Studies Miami-Dade Junior College Miami, Florida President, ATEA
Recorder:	Stanley Patterson Associate Executive Secretary American Technical Education Association Delmar, New York
SUBJECT XIV	"PARADE OF PAST ATEA PRESIDENTS"
Address:	"Development of Human Potential - A National Responsibility" Honorable Jim Wright U. S. Representative Texas
	Introduced by: Joe B. Rushing Chancellor Tarrant County Junior College Fort Worth, Texas
1:45 p.m.	CLINIC ADJOURNED

Appendix C

PLANNING COMMITTEE

Program Co-Chairmen

Dr. Walter Brooking	Mr. Jimmie C. Styles
Division of Vocational & Technical Education	Vice Chancellor for Research & Development
U. S. Office of Education	Tarrant County Junior College
Washington, D. C.	Fort Worth, Texas

SOUTHWESTERN REGION

Representative

Dr. Jack Tompkins, Vice President
Texas State Technical Institute
Waco, Texas

States Included

Alabama
Louisiana
Mississippi
Tennessee
Texas

LOCAL PLANNING COMMITTEE

CHAIRMAN

Mr. Henry E. Chitsey, Director
Program Development
Tarrant County Junior College
Fort Worth, Texas

COMMERCIAL EXHIBITS

Mr. Jim F. Reed, Coordinator
Vocational-Technical Programs
Tarrant County Junior College
Fort Worth, Texas

SECRETARY-TREASURER

Mrs. Carol A. Reynolds, Sec.
Dir. of Program Development
Tarrant County Junior College
Fort Worth, Texas

COMMUNICATIONS & AUDIO-VISUAL

Mr. Jimmy O'Dell, Assistant Dean
Vocational-Technical Education
Tarrant County Junior College
Northeast Campus
Hurst, Texas

TOURS

Dr. H. E. Miesch, Assistant Dean
Vocational-Technical Education
Tarrant County Junior College
South Campus
Fort Worth, Texas

FACILITIES AND HOUSING

Mrs. Pat Cody Blevins
Assistant Director of Research
Tarrant County Junior College
Fort Worth, Texas

REGISTRATION

Mr. Edward A. Windebank, Jr.
Asst. Dir. of Cont. Education
Tarrant County Junior College
Fort Worth, Texas

Appendix D

ATTENDANCE BY STATES

Alabama	4
Arizona	6
Arkansas	4
California	3
Colorado	4
Connecticut	4
Florida	19
Georgia	3
Hawaii	1
Idaho	1
Illinois	11
Indiana	1
Iowa	5
Kansas	4
Kentucky	8
Louisiana	1
Maine	2
Maryland	6
Massachusetts	6
Michigan	14
Minnesoto	7
Mississippi	11
Missouri	4
Montana	4
Nebraska	6
Nevada	4
New Jersey	4
New Mexico	7
New York	10
North Carolina	20
Ohio	7
Oklahoma	16
Pennsylvania	13
South Carolina	5
South Dakota	1
Tennessee	11
Texas	128
Utah	5
Virginia	3
Washington, D.C.	4
Washington	2
Wisconsin	17

Canada	3
Puerto Rico	2

TOTALS

401	Conferees
36	Vendor Representatives
437	Total Participants

Appendix E

EXHIBITORS

NAME AND ADDRESS	REPRESENTATIVE
American College Testing Program P.O. Box 168 Iowa City, Iowa 52240	Dorothy Ballard
American Technical Society 848 East 58th Street Chicago, Illinois 60637	Harry W. Sears
Brodhead-Garrett Company 4560 East 71st Street Cleveland, Ohio 44105	Thomas K. Rogers Don Klapp
Clausing Corporation P.O. Box 667 Decatur, Georgia 30031	Curtis Coates 3710 Meadowbrook Fort Worth, Texas 76103
Cummings Publishing Company, Inc. 2727 Sand Hill Road Menlo Park, California 94025	William A. Annett
Delmar Publishers P.O. Box 5087 Albany, New York 12205	Gene Fink
Digiac Corporation Ames Court Plainview, L.I., New York 11803	Ross Alsup Vince Randazzo C. R. Wallace
Fabri-Tek Education Systems 1261 South Boyle Avenue Los Angeles, California 90054	Alan Mowbray John Theisen
Feedback, Inc. 438 Springfield Avenue Berkeley Heights, New Jersey 07922	M. J. Lawson Ed B. Bave 4724 South 79th Street Ralston, Nebraska 68127
Gramercy Guild Group, Inc. 1145 A West Custer Place Denver, Colorado 80223	William E. Pearson, Jr. 11335 Lippitt Avenue Dallas, Texas 75218

Hickok Teaching Systems Woburn, Massachusetts 01801	Sky Taylor
	Owen C. Savage Bill Butz Larry Hagar 4321 Creekbend Houston, Texas 77035
Hunter Engineering Company 11250 Hunter Drive Bridgeton, Missouri 63044	Jim L. Taylor
	George Bradley 1517 Dakota Garland, Texas 75041
McGraw-Hill Book Company 330 West 42nd Street New York, New York 10036	Robert K. Fox 5930 East Blvd. Dallas, Texas 75206
McKnight & McKnight Publishing Co. P.O. Box 854 Bloomington, Illinois 61701	J. M. Crawford
Philco Ford Corporation 4700 Wissahickon Avenue Philadelphia, Pennsylvania	Hyland Haas Universe Bldg. Ste. 221 6401 Tinker Expressway Midwest City, Okla. 73110
	Owen T. Tolson 3326 Old Colony Dallas, Texas 75233
Prentice-Hall, Inc. Englewood Cliffs, New Jersey 07632	Major M. Brooks Wes Gilpin
Scott-Engineering Sciences 1400 S.W. 8th Street Pompano Beach, Florida 33060	Louis Cantor 4350 North Central Dallas, Texas 75206
Sun Electric Corporation 1821 North Beckley Avenue Dallas, Texas 75213	Earl Lamont Jim Ener Truman Gray Leland Moncrief
Tarrant County Junior College 1400 Fort Worth Nat'l Bank Bldg. Fort Worth, Texas 76102	Jim F. Reed

Vishay Research and Education
P.O. Box 456
Romulus, Michigan 48174

C. C. Perry

WAVETEK
P.O. Box 651
San Diego, California 92123

E. Curt Ball

Harold Cobb
Data Marketing Associates
10050 Monroe Drive
Dallas, Texas 75229

Appendix F

CONFEREES

ALABAMA

Amaro, James P., Vocational and Industrial Arts Education Department, University of Alabama, P.O. Box 6243, University, Alabama 35486.

Kurth, Edwin L. (Dr.), Professor, School of Education, Auburn University, Auburn, Alabama 36830.

Mosley, John C., Director, Hobson State Technical Institute, Thomasville, Alabama.

Stephens, George T. (Dr.), Vocational and Industrial Arts Education Department, University of Alabama, P.O. Box 6243, University, Alabama 35486.

ARIZONA

Frey, Dean R., Supervisor of Technical Education, State Department of Education, Vocational Division, 1333 West Camelback Road, Phoenix, Arizona 85013.

James, Calvin E. (Dr.), Teacher Educator, Northern Arizona University, School of Applied Science, Flagstaff, Arizona 86001.

Koeppen, Jack A., Director of Industrial Technology, Pima College, Anklam Road, Tucson, Arizona.

Little, Dick (Dr.), Central Arizona College, Coolidge, Arizona 85228.

Macon, Charles, R., County Coordinator of Vocational-Technical Education, Pima College, 2202 West Anklam Road, Tucson, Arizona.

Nicholls, George C., Dean of Occupational Programs, Pima College, 2202 West Anklam Road, Tucson, Arizona.

ARKANSAS

Currie, Hurthle L., Teacher Educator, Agricultural, Mechanical, and Normal College, North Cedar Street, Pine Bluff, Arkansas 71601.

Davis, Harrell C., Assistant Director, Cotton Boll Vocational and Technical School, P.O. Box 36, Burdett, Arkansas 72321.

Mullen, James H., Director, Crowley's Ridge Vocational-Technical School, Forrest City, Arkansas 72335.

Stanley, William L., Director, Delta Vocational-Technical School, P.O. Box 279, Marked Tree, Arkansas 72365.

CALIFORNIA

Fine, Albert K. (Dr.), Technician Division Chairman, College of San Mateo, 1700 West Hillsdale Boulevard, San Mateo, California 94402.

Morosi, Bill, Dean of Educational Services, Los Angeles Pierce College, 6201 Winnetka Avenue, Woodland Hills, California 91364.

Ralston, Lee W., Consultant, AMIDS, 2112 Linnington Avenue, Los Angeles, California 90025.

COLORADO

Burden, James L., Dean of Occupational Education, Aims College, P.O. Box 69, Greeley, Colorado 80631.

Heckman, William J., Chairman of Technology Department, Arapahoe Community College, 5900 South Santa Fe, Littleton, Colorado 80120.

Johnson, C. Bernel, State Supervisor of Technical Education, State Board Community Colleges and Occupational Education, 1525 Sherman Street, Denver, Colorado 80203.

Larson, Milton E., Professor of Vocational Education, Colorado State University, 115 Vocational Education Building, Fort Collins, Colorado 80521.

CONNECTICUT

Juszli, Frank L., President, Norwalk State Technical College, 181 Richards Avenue, Norwalk, Connecticut 06854.

Raimondi, Thomas V., President, Hartford State Technical College, Flatbush Avenue, Hartford, Connecticut 06106.

Righthand, Herbert (Dr.), Assistant State Director of Vocational Education, Connecticut State Department of Education, Hartford, Connecticut.

Smith, Howard S., Managing Editor, Industrial Education Magazine, 22 West Putnam Avenue, Greenwich, Connecticut 06830.

FLORIDA

Abell, Norman E., Associate Professor and Head of Mechanical Engineering Technology, Brevard Community College - Cocoa, Florida

Arnold, Joseph P. (Dr.), Chairman, Division of Vocational, Technical and Adult Education, Florida International University, Tamiami Trail, Miami, Florida 33144.

Book, Robert L., Drafting Design Professor, Palm Beach Junior College, 4200 Congress Avenue, Lake Worth, Florida 33460.

Cohen, Nathan L., Associate Dean, Miami-Dade Junior College, 141 NE 3rd Avenue, Miami, Florida 33162.

Cunningham, Lawrence W., Associate Dean of Career and Community Programs, Valencia Community College, P.O. Box 3028, Orlando, Florida 32802.

Defore, Jesse J. (Dr.), Associate Professor, College of Education, University of Florida, Gainesville, Florida 32601.

Dennis, Huerta W., Supervisor - Curriculum Development, Duval County Public Schools, 1450 Flagler Street, Jacksonville, Florida 32207.

Gaugh, Rexford D., Director, Pinellas Vocational-Technical Institute, 6100 154th Avenue North, Clearwater, Florida 33516.

Koschler, Theodore (Dr.), Vice President for Administration, Miami-Dade Junior College, 11011 S.W. 104th Street, Miami, Florida 33156.

Mehallis, George, Director, Technical/Vocational Studies, Miami-Dade Junior College, 11380 N.W. 27th Avenue, Miami, Florida 33167.

Myers, John E., Technical Specialist, Duval County Board of Public Institute, 1450 Flagler Avenue, Jacksonville, Florida 32207.

Ray, Richard D., Assistant Administrator for Technical and Health Occupations Education, Florida Department of Education, Tallahassee, Florida 32304.

Simpson, Stanley A., Consultant for Technical Education, Florida Department of Education, Suite 116, Lake Ellenor Drive, Orlando, Florida.

Stephenson, Frank J., Director of Career Education, Polk Community College, 999 Avenue G, N.E., Winter Haven, Florida 33880.

Strickland, Thomas W. (Dr.), Director of Technical and Health Occupations Education, Florida State Department of Education, Tallahassee, Florida 32304.

Tinsley, B. R., Director of Technical and Occupational Education, Manatee Junior College, Bradenton, Florida 33505.

Whipple, Ormond F., Chairman of Technical Engineering Division, Broward Community College, 3501 S.W. Davie Road, Fort Lauderdale, Florida 33314.

Whitmer, Don Chandler, Dean of Technical Education, Palm Beach Junior College, 4200 South Congress, Lake Worth, Florida 33460.

Williams, Rudy V., Director, Division of Occupational Education, Miami-Dade Junior College, 11011 S.W. 104th Avenue, Miami, Florida 33156.

GEORGIA

Ferguson, Robert A., Director, Atlanta Area Technical School, 1560 Stewart Avenue, S.W., Atlanta, Georgia 30310.

Lloyd, John H. Jr., State Supervisor of Technical Education, Georgia Department of Education, 332 State Office Building, Atlanta, Georgia 30334.

Mellinger, Barry L. (Dr.), Executive Secretary, Southern Association of Colleges and Schools, 795 Peachtree Street, Atlanta, Georgia 30308.

HAWAII

Inaba, Lawrence A. (Dr.), Specialist, Industrial Technical Education, Department of Education, P.O. Box 2360, Honolulu, Hawaii 96804.

IDAHO

Garbett, Harold D., Assistant Director, Vocational-Technical Education, Idaho State University, Pocatello, Idaho 83201.

ILLINOIS

Bigelo, Harry, Executive Assistant, Applied Physics Division, Argonne National Laboratory, 9700 South Cass Avenue, Argonne, Illinois 60439.

Broghamer, Edward L. (Dr.), Professor of ME, University of Illinois. 350 MEB, Urbana, Illinois 61801.

Dallman, M. H., Chairman, Technologies Department, Vocational-Technical Institute, S.I.U., Carbondale, Illinois 62901.

Dobrovolny, Jerry (Dr.), Head, Department of General Engineering, University of Illinois, South Wright Street, Urbana, Illinois 61801.

Huber, Harold D., Dean of Vocational-Technical Education, Spoon River College, 102 East Elm, Canton, Illinois 61520.

Leddy, Martin E., Assistant for Occupational Programs, Illinois Central College, P.O. Box 2400, E. Peoria, Illinois 61611.

Matz, Clifton H., Assistant Dean for Career Programs, Parkland College, 2 Main Street, Champaign, Illinois 61820.

Nee, John Gerald, Technical Science Instructor, Lincoln Land Community College, Springfield, Illinois 62703.

Phipps, Lloyd J. (Dr.), Chairman, Department of Vocational and Technical Education, University of Illinois, Urbana, 345 Education Building, Urbana, Illinois 61801.

Pratt, Arden L. (Dr.), Dean, Vocational-Technical Institute, Southern Illinois University, 908 Wall Street, Carbondale, Illinois 62901.

Rupprecht, Paul E., Dean of Sciences, Olive-Harvey College, 10001 South Woodlawn Avenue, Chicago, Illinois 60628.

INDIANA

Rainey, Gilbert L., Head, Department of Electrical Technology, Purdue University, Michael Golden Labs, Lafayette, Indiana 47907.

IOWA

Cross, James D., Consultant, Post-Secondary Services - Trades, Industrial, Technical Education, Iowa State Department of Public Instruction, Grimes State Office Building, Des Moines, Iowa 50315.

Crowley, Robert A., Instructional Resources Coordinator, Hawkeye Institute of Technology Merged Area (Education) VII, Airline Highway, P.O. Box 8015, Waterloo, Iowa 50704.

Freitag, Arnold J., Teacher Educator, University of Northern Iowa, Cedar Falls, Iowa 50613.

Sarchett, Alvie M., Assistant Professor, Iowa State University, 102 Industrial Education Building, Ames, Iowa 50010.

Wolansky, William D. (Dr.), Professor-in-Charge, Iowa State University, 202 Industrial Education Building, Ames, Iowa 50010.

KANSAS

Buchwald, Donald L., Professor and Head of Mechanical Technology Department, Kansas Technical Institute, Salina, Kansas 67401.

Karl, Norman H., Coordinator, Career Education, Johnson County Community College, 57th Merriam, Shawnee Mission, Kansas 66203.

Koon, George W., Dean of Technical Education, Hutchinson Community Junior College, 1300 North Plum, Hutchinson, Kansas 67501.

Lindsey, Carl E., Director, Engineering and Technology, Johnson County Community College, 57th Merriam, Shawnee Mission, Kansas 66203.

KENTUCKY

Bacon, Mary L., Coordinator, Occupational Education, Somerset Community College, Monticello Road, Somerset, Kentucky 42501.

Bartel, Fred C., Assistant Director, Trade and Industrial Education. Bureau of Vocational Education, Department of Education, State Office Building, Frankfort, Kentucky 40601.

Hall, Harold L., Data Processing Instructor, Lexington Technical Institute, University of Kentucky Community College System, Room 4, Administration Building, Lexington, Kentucky 40506.

Hauselman, A. J. (Dr.), Coordinator, Research and Program Development, University of Kentucky Community College System, Breckenridge Hall, Lexington, Kentucky 40506.

Piekarski, Marie L., Coordinator, Program Planning and Development, Community College System, University of Kentucky, Lexington, Kentucky 40506.

Puckett, Russell E., Professor of Engineering Technology, College of Engineering, University of Kentucky, Lexington, Kentucky 40506.

Spence, Toni, Counselor, Lexington Technical Institute, Breckenridge Hall, University of Kentucky, Lexington, Kentucky 40505.

Stephens, Keith, Coordinator of Federal Programs, University of Kentucky Community College System, 110 Breckenridge Hall, Lexington, Kentucky 40506.

LOUISIANA

Detrie, Arthur J., Supervisor - Property Officer, State Department of Education, Box 44064, Capitol Station, Baton Rouge, Louisiana 70804.

MAINE

Rhoads, Robert B., Associate Director, Technical Institute Division, College of Technology, University of Maine, 208 Boardman Hall, Orono, Maine 04473.

Whitney, Fred W., Director, Kennebec Valley Vocational-Technical Institute, Waterville School Department, Brooklyn Avenue, Waterville, Maine 04901.

MARYLAND

Friedman, Jack W., Director, Business and Technical Studies, Community College of Baltimore, 2901 Liberty Heights Avenue, Baltimore, Maryland 21215.

Hawkes, Dennis A., Associate Dean of Instruction, Frederick Community College, Frederick, Maryland 21701.

Scarlett, Joseph A., Director of Career Programs, Catonsville Community College, 800 South Rolling Road, Catonsville, Maryland 21228.

Smith, James S., Specialist, Post-Secondary Education, Maryland State Department of Education, 600 Wyndhurst Avenue, Baltimore, Maryland 21210.

Wise, Daniel C., Dean of Technical Education, Prince George's Community College, 301 Largo Road, Largo, Maryland 20870.

Youngblood, Robert L., Associate Dean, Allegany Community College, Willow Brook Road, Cumberland, Maryland 21502.

MASSACHUSETTS

Angus, Robert B., Manager of Field Development, TERC, 44 Brattle Street, Cambridge, Massachusetts 02138.

Ginn, Clyde N. (Dr.), Vocational-Technical Director, Southwest Junior College, Summit, Massachusetts 39666.

Malone, David F., Dean, Blue Hills Technical Institute, 100 Randolph Street, Canton, Massachusetts 02021.

Steeves, John G., Acting Director - Curriculum Center, Wentworth Institute, 550 Huntington Avenue, Boston, Massachusetts 02115.

VanDusen, Edward B. (Dr.), Director, Division of Evening Studies, Lowell Technological Institute, 1 Textile Avenue, Lowell, Massachusetts.

Verney, Walter C., Senior Program Officer, U. S. Office of Education, Region I, J. F. Kennedy Federal Building, Government Center, Boston, Massachusetts 02203.

MICHIGAN

Chalker, Fred J., Automotive Technology, Muskegon Community College, 221 South Quarterline, Muskegon, Michigan.

Ford, Andrew F., Director, Technical and Industrial Division, Washtenaw Community College, P.O. Box 345, Ann Arbor, Michigan 48107.

Harris, Richard (Dr.), Associate Professor of Trade-Technical Education, Ferris State College, Audiovisual Building, Big Rapids, Michigan 49307.

Hartshorn, Austin, Dean of Occupational Education, Macomb County Community College, 16500 Hall Road, Mt. Clemens, Michigan 48043.

Hiscock, Francis L., Dean of Applied Sciences, Southwestern Michigan College, Dowagiac, Michigan 49047.

Howell, Herbert L., Chairman, Vocational-Technical Department, Jackson Community College, 2111 Emmons Road, Jackson, Michigan 49201.

Kleinsmith, Wilbert C., Chairman, Technical Division, Delta College, University Center, Michigan 48710.

Kohrman, George E. (Dr.), Dean, College of Applied Science, Western Michigan University, Kalamazoo, Michigan 49001.

Lamb, Frederick W., Chairman, Division of Applied Science, Genesee Community College, 1401 East Court, Flint, Michigan 48503.

Midjaas, Ruth E. (Dr.), Consultant, Oakland Schools, 2100 Pontiac Lake Road, Pontiac, Michigan 48054.

Myers, Orson S., Chairman, Technical Division, Grand Rapids Junior College, 143 Bostwick, N.E., Grand Rapids, Michigan 49502.

Perry, C.C. (Dr.), General Manager, Vishay Research and Education, P.O. Box 456, Romulus, Michigan 48174.

Shanahan, John J., Post-Secondary Occupational Specialist, Michigan Department of Education, Vocational Education Service, Box 928, Lansing, Michigan.

Steely, Robert D., Dean of Applied Arts and Sciences, Kellogg Community College 450 North Avenue, Battle Creek, Michigan 49016.

MINNESOTA

Casserly, Robert X., Owner and Director, MPLS Drafting School, 3407 Chicago Avenue, MPLS, Minnesota.

Caveness, Gaward F., Assistant Professor, Agricultural Engineering Technology, University of Minnesota Technical College, Crookston, Minnesota 56716.

Larrabee, David E. (Dr.), Curriculum Coordinator, University of Minnesota Technical College, Crookston, Minnesota 56716.

Schmehl, Jerome J., Consultant/Program Planning and Development, State Department of Vocational Education, 550 Capitol Square, St. Paul, Minnesota 55101.

Shubert, C. Loyd (Dr.), Professor of Education, Mankato State College, Mankato, Minnesota 56001.

Vaes, Ruth G., Editorial Manager-Published Products, 3M Company, Building 235-2N, St. Paul, Minnesota 55101.

Whiteford, Emma B., Professor of Home Economics Education, University of Minnesota, 106 McNeal Hall, St. Paul, Minnesota.

MISSISSIPPI

Beasley, Arthur L., Assistant Director of Vocational-Technical Education, Jones County Junior College, Ellisville, Mississippi 39437.

Caldwell, Ralph M., State Supervisor - Technical Education, State Department of Education, Vocational-Technical Division, Box 771, Jackson, Mississippi 32905.

Carter, M. P., Director of Vocational-Technical Education, Jones County Junior College, Ellisville, Mississippi 39437.

Combest, Lewis L., Assistant Director, Special Vocational Education, Jones County Junior College, Ellisville, Mississippi 39437.

Hunter, Max, Chairman, Industrial and Technical Education, University of Southern Mississippi, Southern Station, Box 36, Hattiesburg, Mississippi 39401.

Lipscomb, William P. (Dr.), Executive Dean, Mississippi Gulf Coast Junior College, Switzer Road, Gulfport, Mississippi 39501.

Lucas, J. J., Director of Vocational-Technical Education, Copiah-Lincoln Junior College, P.O. Box 8, Fayette, Mississippi 39069.

Milner, Sammy G., Department of Youth Affairs and Training, Mississippi A&I Board, 1504 State Office Building, Jackson, Mississippi 39205.

Nations, Kermit A., Coordinator Program Services Post-Secondary Vocational, State Department of Education, P.O. Box 771, Jackson, Mississippi.

Scofield, Carlie D., Vocational-Technical Director, Mississippi Gulf Coast Junior College, Hands Borough Station, Gulfport, Mississippi.

Sunday, Arthur L., Chairman, Technical Training, Mississippi Gulf Coast Junior College, Jackson County Campus, Gautier, Mississippi.

MISSOURI

Anderson, Chester R., Specialist III, Vocational Programs for Disadvantaged and Handicapped, Kansas City, Missouri, Public Schools, 1211 McGee, Kansas City, Missouri 64106.

Andrews, John E., Supervisor of Technical Education, State Department of Education, P.O. Box 480, Jefferson City, Missouri 65101.

Smith, Chester V., Drafting Teacher, Penn Valley Community College, 560 Westport Road, Kansas City, Missouri.

Weaver, Gerald L., Dean of Occupational and Continuing Education, East Central Junior College, Highway 50 East and Moselle Road, Union, Missouri 63084.

MONTANA

Downey, Thomas E., Director, Missoula Technical Center, 909 South Avenue West, Missoula, Montana 59801.

Mikkeisen, Ralph W., Supervisor of Technical Education, Office of the Superintendent of Public Instruction, Capitol Building, Helina, Montana 59601.

Morrison, John A., Guidance Counselor, Billings Vocational-Technical Center, 219 North 25th Street, Billings, Montana.

Scheidt, Irvin L., Assistant Director, Billings Vocational-Technical Center, 219 North 25th Street, Billings, Montana 59101.

NEBRASKA

Andrews, Don (Dr.), Dean of Academic Affairs, Omaha Nebraska Technical Community College, 4469 Farnum Street, Omaha, Nebraska 68131.

Echtenkamp, K. J., Director of Instructional Services, Northeast Nebraska Technical College, P.O. Box 888, Norfolk, Nebraska 68701.

Erdkamp, Walter E., Director of T & I and Technical, State Department of Education, 233 South 10th, Lincoln, Nebraska 68508.

Koch, Jerry D., Director, Omaha Suburban Area Council of Schools, 216 Hillcrest Building, Ralston, Nebraska 68127.

Welsh, Lowell A., President, Nebraska Technical College, Milford, Nebraska 68405.

Wheeier, Wayne H., Supervisor of Technical and Industrial Education, Lincoln Nebraska Technical College, Box 82889, Lincoln, Nebraska 68501.

NEVADA

Howard, Vernon L, Supervisor of Technical and Post-Secondary Programs, Nevada State Department of Education, Heroes Memorial Building, Carson City, Nevada 89701.

Kuntz, Elmer L., President, Elko Community College, 8th and Court Street, Elko, Nevada 89801.

Lee, Ivan E., Teacher Educator, University of Nevada Reno, Reno, Nevada 89507.

Wolf, Harry J. (Dr.), Research and Educational Planning, University of Nevada, 9th and Center Street, Reno, Nevada 89507.

NEW JERSEY

Billiet, Walter E. (Dr.), Director of Technical Education, State of New Jersey, 225 West State Street, Trenton, New Jersey 08625.

McNeice, William C., Superintendent, Sussex County Vocational-Technical School, 105 North Church Road, Sparta, New Jersey 07871.

Messinger, Carl A., Director of Post-Secondary Education, Camden County Vocational and Technical School, Sicklerville, New Jersey.

Tornell, Henry E., Supervising Consultant, Post-Secondary Education, New Jersey State Department of Education, Vocational Division, 225 West State Street, Trenton, New Jersey 08625.

NEW MEXICO

Boulton, Jack, Assistant State Supervisor, New Mexico State Department of Vocational Education - T&I Division, Capitol Building, Santa Fe, New Mexico 87501.

Brandt, Harold K., Chairman, Department of Industrial Education, New Mexico Highlands University, P.O. Box 996, Las Vegas, New Mexico 87701.

Elliott, George W., T.I. Recruiter, Sandia Laboratories, 4809 Madison Court, N.E., Albuguerque, New Mexico 87115.

Gober, D. G., Instructor, New Mexico Junior College, Lovington Highway, Hobbs, New Mexico 88240.

Siegenthaler, H. E. (Dr.), Dean of Vocational-Adult Education, New Mexico Junior College, Lovington Highway, Hobbs, New Mexico 88240.

Soderbolm, Albert L., Director of Technical Education, New Mexico Highlands University, 1315 4th Street, Las Vegas, New Mexico 87701

Young, Jack, Professor of Automotives, New Mexico Junior College, Lovington Highway, Hobbs, New Mexico 88240.

NEW YORK

Benenati, Carl G. (Dr.), Chief, Bureau of Trade and Technical Education, New York State Education Department, 99 Washington Avenue, Albany, New York 12210.

Clarcq, Jack R. (Dr.), Assistant Dean for Technical Education, National Technical Institute for the Deaf, One Lomb Memorial Drive, Rochester, New York 14623.

De Cristofaro, S., Director of Applied Science Division, Rochester Institute of Technology, One Lomb Memorial Drive, Rochester, New York 14624.

Fenninger, William N., Executive Secretary, American Technical Education Association, Inc., P.O. Box 31, Delmar, New York 12054.

Forman, James D., Director, School of Applied Science, Rochester Institute of Technology, One Lomb Memorial Drive, Rochester, New York 14623.

Irwin, Armond J., Editor, Technical Education News, Mc-Graw-Hill Book Company, 330 West 42nd Street, New York, New York.

Klafehn, Robert N., Chairman, Engineering Technology Department, National Technical Institute for the Deaf, 1 Lomb Memorial Drive, Rochester, New York 14623.

Lesure, Alan B., Editor, John Wilet and Sons, 605 Third Avenue, New York, New York 10016.

Patterson, Stanley, Assistant Two-year College Programs, American Technical Education Association, Inc., Box 347, Leesome Road, Altamont, New York.

Quimby, Edgar A., Associate Dean for Curriculum and Instruction, Genesee Community College, College Road, Batavin, New York 14020.

NORTH CAROLINA

Apple, Paul D., Dean of Instruction, Forsyth Technical Institute, 2100 Sylas Creek Parkway, Winston Salem, North Carolina.

Armfield, George W., Dean of Occupational and Transfer Education, Caldwell Community College and Technical Institute, P.O. Box 600, Lenoir, North Carolina 28645.

Brown, Larry, W., Instructor, McDowell Technical Institute, P.O. Drawer 1049, Marion, North Carolina 28752.

Cannady, Leonard H., Drafting Department Head and Instructor, W. W. Holding Technical Institute, Route 10, Box 200, Raleigh, North Carolina 27603.

Collins, Harold K., President, Durham Technical Institute, P.O. Box 11307, Durham, North Carolina 27703.

Denning, G. E., Director of Occupational Education, Isothermal Community College, P.O. Box 804, Spindale, North Carolina 28160.

Eckard, Miles L. (Dr.), Educational Consultant, North Carolina Department of Community Colleges, Education Building, Raleigh, North Carolina.

Edwards, Walter A., Administration, Randolph Technical Institute, Drawer 1009, Asheboro, North Carolina 27203.

Irwin, Donald N., Dean of Instruction, Southwestern Technical Institute, Box 95, Sylva, North Carolina 28779.

Lineberger, Ervin, Dean of Instruction, Catawba Valley Technical Institute, Highway 64-70 East, Hickory, North Carolina 28601.

Moretz, H. D., Dean of the College, Western Piedmont Community College, I-40 at U.S. 64, Morganton, North Carolina 28655.

Olsen, Harold P., Director of Occupational Education, Western Piedmont Community College, I-40 at U.S. 64, Morganton, North Carolina 28655.

Paap, Robert E., President, Catawba Valley Technical Institute, Highway 64-70 East, Hickory, North Carolina 28604.

Richardson, William R. (Dr.), Dean of Instruction, Wilkes Community College, Drawer 120, Wilkesboro, North Carolina 28697.

Roy, Roland L. (Dr.), Educational Consultant, Central Piedmont Community College, P.O. Box 4009, Charlotte, North Carolina 28204.

Starling, George W., Director of General, Adult Education and A.B.E., Halifax County Technical Institute, P.O. Drawer 809, Weldon, North Carolina.

Stewart, John S., Department Head of Drafting and Design, Technical Institute of Alamance, 411 Camp Road, Burlington, North Carolina.

Thompson, Howard E. (Dr.), President, Wilkes Community College, Drawer 120, Wilkesboro, North Carolina 28697.

Van Dyke, Jerry L., Director of Occupational Education, McDowell Technical Institute, P.O. Drawer 1049, Marion, North Carolina 28752.

Wilson, Richard O., Director of Student Services, Southwestern Technical Institute, P.O. Box 95, Sylva, North Carolina 28779.

OHIO

Buterbaugh, John M., Administrative Editor, Merrill Publishing Company, 1300 Alum Creek Drive, Columbus, Ohio 43216.

Gillespie, Robert E., Director of Informational Services, Cincinnati State Technical College, 3520 Central Parkway, Cincinnati, Ohio 45223.

Lisowski, Raymond, Coordinator of Engineering Technologies, Cuyahoga Community College, Western Campus, Technical Education Department, 7300 York Road, Parma, Ohio 44130.

Mills, William T., Administrative Dean, Muskingum Area Technical Institute, 400 Richards Road, Zanesville, Ohio 43701.

Nestor, Harold M. (Dr.), Executive Vice President, Columbus Technical Institute, 550 East Spring Street, Columbus, Ohio 43215.

Schlimm, Frederick B., Vice President for Internal Affairs, Cincinnati State Technical College, 3520 Central Parkway, Cincinnati, Ohio.

Stiner, Clyde E., Dean of Instruction, Lorain County Community College, 1005 North Abbe Road, Elyria, Ohio 44035.

OKLAHOMA

Ballard, Jo Barry, Assistant State Supervisor of Technical Education, State Department of Vocational and Technical Education, 1515 W. 6th, Stillwater, Oklahoma 74074.

Brown, Gary E., Director of Technical Education, Oscar Rose Junior College, 6420 S.E. 15th, Midwest City, Oklahoma.

Chandler, Philip P. (Dr.), Director, Oklahoma State University Technical Institute, 900 North Portland, Oklahoma City, Oklahoma 73107.

Delano, Dale C., Associate Director, Oklahoma State University Technical Institute, 900 North Portland, Okalhoma City, Oklahoma 73107.

Hobbs, Wesley (Dr.), Assistant Director for Academic Affairs, Oklahoma State Technical College, Okmulgee, Oklahoma.

Hunter, Lester E., Assistant Director for Student Affairs/Director of Admissions, Oklahoma State University Technical Institute, Oklahoma City Campus, 900 North Portland, Oklahoma City, Oklahoma.

Keck, Robert V., Dean and Director of Technical Education, Eastern Oklahoma State College, Wilburton, Oklahoma 74578.

Malone, Bill, Instructor, Northern Oklahoma College, Tonkawa, Oklahoma 74653.

Mitchell, Jesse B. (Dr.), Assistant State Supervisor of Technical Education, State Department of Vocational and Technical (Oklahoma), 1515 West Sixth Avenue, Stillwater. Oklahoma 74074.

Mitchell, R. Dahl, Oscar Rose Junior College, 422 W. ERCoupe, Midwest City, Oklahoma 73110.

Park, Robert G. (Dr.), Chairman, Division of Engineering and Science, Oscar Rose Junior College, 6420 S.E. 15th, Midwest City, Oklahoma.

Skouby, Eric W., Instructor, Northern Oklahoma College, Tonkawa, Oklahoma 74653.

Smith, Roger, Vice President, Tulsa Junior College, 705 NBC Building, Tulsa, Oklahoma 74102.

Wells, Bill, Coordinator of Technical-Occupational Programs, Tulsa Junior College, 10th and Boston, Tulsa, Oklahoma 74119.

Wilholt, J. D., Chairman of Technology, Northeastern A&M College, Miami, Oklahoma 74354.

Zimmerman, William L., Assistant Director for Business and Finance, Oklahoma State University Technical Institute, 900 North Portland, Oklahoma City, Oklahoma 73107.

PENNSYLVANIA

Benson, Ralph A., Lecturer, University of Pittsburgh, Room 2604 C.L., Pittsburgh, Pennsylvania 15131.

Brown, Robert G., Director of Vocational Education, Mercer County Area Vocational-Technical School, P.O. Box 152, Mercer, Pennsylvania.

Dryburg, Thomas A., Assistant Principal-Vocational Director, Butler Area Schools, 165 New Castle Road, Butler, Pennsylvania 16001.

Humphrey, John, Chairman, Department of Biological Sciences, Community College of Allegheny County - South Campus, Sixth and Market Street, McKeesport, Pennsylvania 15132.

Jacoby, Robert, Senior Program Specialist, Trade and Industrial Education, Pennsylvania Department of Education, Harrisburg, Pennsylvania.

Johnston, Robert M., Chairman, Division of Sciences, Business, Math and Technologies, Community College of Allegheny County - South Campus, Sixth and Market Street, McKeesport, Pennsylvania 15132.

Kelley, Kenneth F., Staff Assistant, Cumberland Perry Area Vocational-Technical School, Road #4, Mechanicsburg, Pennsylvania 17078.

Kelly, William T. (Dr.), Director of Vocational-Technical Education, School District of Philadelphia, 734 Schuylkill Avenue, Phildelphia, Pennsylvania 19146.

Maynard, Bernard, Chairman, Department of Physical Sciences and Technologies, Community College of Allegheny County - South Campus, Sixth and Market Street, McKeesport, Pennsylvania 15132.

Muchler, K. J., Director of Vocational-Technical Education, Wilkes-Barre Area School District, 730 South Main Street, Wilkes-Barre, Pennsylvania 18711.

Nagle, Robert A., Director, Lehigh County Technical School, 2300 Main Street, Schnecksville, Pennsylvania 18087.

Pellegrino, James P. (Dr.), Assistant Professor, University of Pittsburgh, Fifth Avenue, Pittsburgh, Pennsylvania.

Williams, William A. (Dr.), Co-chairman, Department of Vocational Education, Pennsylvania State University, 245 Chambers Building, University Park, Pennsylvania 16802.

SOUTH CAROLINA

Canup, Claude R., Administrative Assistant, Greenville Technical Education Center, Box 5616, Station B, Pleasantburg Drive, Greenville, South Carolina 29606.

Goldsmith, George W., Jr., Dean of Instruction, Greenville Technical Education Center, Box 5616, Station B, Pleasantburg Drive, Greenville, South Carolina 29606.

Mulkey, Hal R., Business Division Chairman, Greenville Technical Education Center, Box 5616, Station B. Pleasantburg Drive, Greenville, South Carolina 29606.

Salley, Jake, Director of Curriculum, South Carolina Committee for Technical Education, 1429 Senate Street, Columbia, South Carolina.

Turner, Nancy L., Nursing Division Chairman, Greenville Technical Education Center, Box 5616, Station B, Pleasantburg Drive, Greenville, South Carolina 29606.

SOUTH DAKOTA

Heusinkueld, Marion R., Electronics Department Head, USD/S, University of South Dakota-Springfield, Springfield, South Dakota 57062.

TENNESSEE

Becallo, Dan, Head A-V Department, State Technical Institute, 5983 Macon Cove, Memphis, Tennessee 38122.

Hall, Charles E., Instructor of Electrical Engineering, State Technical Institute, 5983 Macon Cove, Memphis, Tennessee 38111.

Hardison, Leon G., Division Head of Related Studies, State Technical Institute, 5983 Macon Cove, Memphis, Tennessee.

Jackson, William W., Assistant Professor, State Technical Institute, 5983 Macon Cove, Memphis, Tennessee.

Long, John E., Assistant Professor of Electronics Technology, Columbia State Community College, Columbia, Tennessee 38401.

MacFadden, Arthur R., Assistant Professor, Chattanooga State Technical Institute, 4501 Amnicola Highway, Chattanooga, Tennessee 37406.

Orem, Clyde, Division Head of Business and Science Technologies, State Technical Institute, 5983 Macon Cove, Memphis, Tennessee.

Pluhar, Joseph, Assistant Professor, State Technical Institute, 5983 Macon Cove, Memphis, Tennessee.

Riggs, Donald D. (Dr.), T&I and Technical Teacher Educator, University of Tennessee, CEB 16, Knoxville, Tennessee 37916.

Scott, Claude V., Counselor, State Technical Institute, 5983 Macon Cove, Memphis, Tennessee.

Whitehead, Charles O., Director, State Technical Institute, 5983 Macon Cove, Memphis, Tennessee.

TEXAS

Ammons, Mitchel L., Dean, Vocational-Technical Education. Wharton County Junior College, 911 Boling Highway, Wharton, Texas 77488.

Anthony, Donald M. (Dr.), President, Tarrant County Junior College, Northeast Campus, 828 Harwood Road, Hurst, Texas 76053.

Archer, Elton (Dr.), Associate Professor, Le Tourneau College, P.O. Box 7001, Longview, Texas 75601.

Baker, J. N., General Manager, Texas State Technical Institute, Mid-Continent Campus, Amarillo, Texas.

Barber, Ray, Director of Occupational Research and Development, Texas Education Agency, 201 East 11th Street, Austin, Texas 78701.

Barham, Ed B., Counselor, United States Air Force, Carswell Air Force Base, Fort Worth, Texas.

Bennett, Gary S., Chairman of Technical-Vocational Education, Kilgore College, 1100 Broadway, Kilgore, Texas 75662.

Benson, Roland A.H., Chief Consultant, Post-Secondary Division, Texas Education Agency, 211 West 11th Street, Austin, Texas 78711.

Betts, Dexter L., Director of Program Development, Dallas County Community College District, Main and Lamar Streets, Dallas, Texas 75202.

Bianchi, David G., Texas State Technical Institute, James Connally Campus, Waco, Texas.

Bice, Doyle R., Instructor of Diesel Mechanics, Lamar University, P.O. Box 10043, Beaumont, Texas 77710.

Billings, E. R., General Manager for Instruction, Texas State Technical Institute, James Connally Campus, Waco, Texas 76705.

Blevins, Pat, Assistant Director of Research and Development, Tarrant County Junior College, 1400 Fort Worth National Bank Building, Fort Worth, Texas 76102.

Boaz, Ted, Dean of Technical-Vocational Education, Del Mar College, 101 Baldwin, Corpus Christi, Texas 78404.

Boehm, Allen O., Vocational-Technical Counselor, San Jacinto College, 8060 Spencer Highway, Pasadena, Texas 77505.

Bolinger, T. D., Vocational-Technical Director, Cooke County Junior College, P.O. Box 815, Gainesville, Texas.

Booth, Frank H., Professor-Program Chairman of Drafting and Design Technology, Texas State Technical Institute, James Connally Campus, Waco, Texas 76705.

Bounds, Glen I., Assistant Dean of Instruction, Dallas County Community College District, Mountain View College, 4849 West Illinois, Dallas, Texas 75211.

Box, Marshall, Dean of Vocational-Technical Education, Howard County Junior College, 11th and Birdwell, Big Spring, Texas 79720.

Boyd, Charles O., Jr. (Dr.), Associate Professor of Health Occupations and Coordinator, Tarrant County Junior College, Northeast Campus, 828 Harwood Road, Hurst, Texas 76053.

Brewer, Cecil H., Instructor of Automotives, Tarrant County Junior College, South Campus, 5301 Campus Drive, Fort Worth, Texas 76119.

Browning, M. A., Director of Adult, Vocational-Technical Education, Office of Education, Region VI, 1114 Commerce Street, Dallas, Texas 75202.

Bullard, T. E., Vice President, Grayson County College, Box 979, Denison, Texas 75020.

Cary, Reby (Dr.), Associate Dean of Student Life, University of Texas at Arlington, Arlington, Texas 76010.

Castillo, Julian, Director, School of Biomedical Arts and Sciences, Amarillo College, Box 447, Amarillo, Texas 79705.

Cavalleri, James A., Assistant Director of Program Development, Dallas County Community College District, Main and Lamar Streets, Dallas, Texas 75202.

Chitsey, Henry E., Director of Program Development, Tarrant County Junior College, 1400 Fort Worth National Bank Building, Fort Worth, Texas 76102.

Churchill, Stanley W., Vocational Director, Temple Junior College, 2600 South First Street, Temple, Texas 76501.

Clements, Clyde C. Jr., Intern, Tarrant County Junior College, 1400 Fort Worth National Bank Building, Fort Worth, Texas 76102.

Cockrell, John L., President, LTV-Ling Altec, Inc., First Bank and Trust Building, Richardson, Texas.

Cox, Kirby H., Division Chairman of Science-Math, Tarrant County Junior College, Northeast Campus, 828 Harwood Road, Hurst, Texas 76053.

Cummens, W. G., Senior Program Officer, Office of Education, Region VI, 1114 Commerce Street, Dallas, Texas 75202.

Dean, Bill J. (Dr.), Director of Vocational-Technical Education, Grayson County College, Box 979, Denison, Texas 75020.

Deliqanis, Tom, Director of Vocational-Technical Education, Laredo Junior College, P.O. Box 738, Laredo, Texas 78040.

Derrett, Delbert H. (Dr.), Director of Continuing Education, Tarrant County Junior College, 1400 Fort Worth National Bank Building, Fort Worth, Texas 76102.

Dobbs, Virginia M., Associate Dean of Instruction-Technical Occupational Education, Dallas County Junior College District, Eastfield College, 3737 Morley Drive, Mesquite, Texas 75149.

Doss, Bryan, Projects Manager, Technical Education Research Center, 1224 Austin Avenue, Waco, Texas 76701.

Ewing, Jack C., Jr., Assistant Manager, Personnel Training Department Brown and Root, Inc., P.O. Box 3, Houston, Texas 77001.

Felty, Mary, Texas State Technical Institute, Rolling Plains Campus, Sweetwater, Texas 79556.

Forney, Martha E., Instructor, Texas State Technical Institute, James Connally Campus, Waco, Texas 76705.

Gaiser, Joe, Jr., Le Tourneau College, P.O. Box 7001, Longview, Texas 75601.

Garcia, Ernest D., Instructor, Texas State Technical Institute, James Connally Campus, Waco, Texas 76705.

Goad, Hiram H., Director, Area Career Education Center, P.O. Box 977, Waxahachie, Texas 75165.

Graver, Gerald L., Program Chairman-Instructional Media Technology, Texas State Technical Institute, James Connally Campus, Waco, Texas 76705.

Griffin, Forest D., Director of Occupational-Technical Education, Tyler Junior College, East Fifth, Tyler, Texas.

Guemple, John R., Associate Commissioner for Occupational Education and Technology, Texas Education Agency, Capitol Station, Austin, Texas 78701.

Gullette, W. H., Dean of Technical Studies, Panola Junior College, Henderson Highway, Carthage, Texas 75633.

Hardwick, Arthur Lee (Dr.), Assistant Regional Commissioner, U. S. Department of Health, Education and Welfare, Office of Education, 1114 Commerce Street, Dallas, Texas.

Haynie, James W., Assistant Director, Division of Post Secondary, Occupational Education and Technology, Texas Education Agency, 201 East 11th, Austin, Texas 78701.

Hendrix, Joe M., Dean of Instruction, El Paso Community College, 4750 Alberta Street, El Paso, Texas 79905.

Hinojosa, Oscar V., Associate Professor, Texas State Technical Institute, Rio Grande Campus, Harlingen, Texas 78550.

Hudson, Kenneth L. (Dr.), Director of Personnel, Tarrant County Junior College, 1400 Fort Worth National Bank Building, Fort Worth, Texas.

Huggins, R. H., General Dynamics, Convair Aerospace Division, P.O. Box 748, Fort Worth, Texas 76101.

Hurst, Kenneth H., Instructor, Engineering-Drafting, Odessa College, P.O. Box 3752, Odessa, Texas 79760.

Isbell, Truman T., Director of Occupational Education, Brazosport College, 500 College Drive, Lake Jackson, Texas 77566.

Krienke, Robert D., Professor, Texas State Technical Institute, James Connally Campus, Waco, Texas.

Kynard, Alfred T., T&I Teacher Educator, Prairie View A&M College, P.O. Box 2917, Prairie View, Texas 77445.

Langley, Billy C., Associate Instructor, Refrigeration and Air-Conditioning Technology, Tarrant County Junior College, South Campus, 5301 Campus Drive, Fort Worth, Texas 76119.

Lauderdale, Victor E., Coordinator and Instructor, Appliance Service and Repair, Tarrant County Junior College, South Campus, 5301 Campus Drive, Fort Worth, Texas 76119.

LeBlanc, Herbert R., Instructor, Kilgore College, 1100 Broadway, Kilgore, Texas 75662.

Lowrey, Norman E., Coordinator of Adult Education, Lamar University, P.O. Box 10043, University Station, Beaumont, Texas 77710.

Lutz, Charles D., Jr., Dean of Technical-Vocational Education, Amarillo College, 24th and Washington, Amarillo, Texas.

Lyons, Russell L., Dean of Vocational-Technical Education, Cisco Junior College, Route 3, Box 3, Cisco, Texas 76437.

Mabry, Roy D., Instructor of Automotives, Tarrant County Junior College, South Campus, 5301 Campus Drive, Fort Worth, Texas 76119.

Maner, Arnold H., Texas A&M University, Bryan, Texas.

McDermott, Thomas A. (Dr.), Regional Dental Program Director, Bureau of Health Manpower Education, Room 8C28, 1100 Commerce, Dallas, Texas 75202.

McKinnerney, Beryl R., Head, Related Arts Department, Lamar University, P.O. Box 10043, University Station, Beaumont, Texas 77710.

McLallen, Dan (Dr.), Dean of Instruction, Tarrant County Junior College, South Campus, 5301 Campus Drive, Fort Worth, Texas 76119.

McLemore, Ernest H., Instructor, Texas State Technical Institute, James Connally Campus, Waco, Texas.

McNeese, Charles H., Assistant Professor and Chairmen, Department of Engineering Technology, Tarrant County Junior College, Northeast Campus, 828 Harwood Road, Hurst, Texas 76053.

Miesch, H. E. (Dr.), Assistant Dean of Instruction for Occupational Education, Tarrant County Junior College, 5301 Campus Drive, Fort Worth, Texas 76119.

Miller, Bob (Dr.), Dean of Instruction, Tarrant County Junior College, Northeast Campus, 828 Harwood Road, Hurst, Texas 76053.

Mullen, Jerry D., Associate Instructor of Electronics, Tarrant County Junior College, South Campus, 5301 Campus Drive, Fort Worth, Texas.

O'Dell, Jimmy, Assistant Dean of Instruction for Occupational Education, Tarrant County Junior College, Northeast Campus, 828 Harwood Road, Hurst, Texas 76053.

O'Neill, James, Assistant Professor, Texas State Technical Institute, James Connally Campus, Waco, Texas 76705.

Owens, Claude C., District Coordinator, Technical-Occupational Education, Dallas County Community College, Main and Lamar Streets, Dallas, Texas 75202.

Pace, Denny, Deputy Regional Administrator, U.S. Department of Justice-LEAA, Region V, Room 407C, 500 South Ervay Street, Dallas, Texas.

Passmore, Bill B., Associate Dean of Instruction, Dallas County Community College, El Centro College, Main and Lamar Streets, Dallas, Texas.

Patton, Margarite Ann, Counselor, Texas State Technical Institute, James Connally Campus, Waco, Texas.

Perkins, Raymond P. (Dr.), Coordinator, Vocational Education Programs, Texas A&M University, College Station, Texas 77843.

Perry, William J., Jr., Director of Technical-Vocational Programs, College of the Mainland, 8001 Palmer Highway, Texas City, Texas.

Pillow, Lovell A., Manager of Curriculum and Facilities, Texas State Technical Institute, James Connally Campus, Waco, Texas 76705.

Powell, Lora B., Guidance Consultant, Region VI, Education Service Center, P.O. Box 348, Huntsville, Texas.

Prater, Robert L. (Dr.), Dean, School of Technology, Texas Southern University, 3201 Wheeler Avenue, Houston, Texas 77004.

Reed, Jim F., Coordinator of Technical-Vocational Programs, Tarrant County Junior College, 1400 Fort Worth National Bank Building, Fort Worth, Texas 76102.

Reed, Lary L., Dean of Technical Arts, Navarro Junior College, Box 1170, Corsicana, Texas.

Reynolds, Cecil L., Assistant Dean of Technical Education, McLennan Community College, 1400 College Drive, Waco, Texas 76708.

Riley, Lewis B., Dean of Occupational and Technical Education, Odessa College, P.O. Box 3752, Odessa, Texas 79760.

Roberts, Harold N., Manager of Instruction, Texas State Technical Institute, Mid-Continent Campus, Box 4228, Amarillo, Texas 79105.

Roney, Maurice (Dr.), Executive Vice President, Texas State Technical Institute, James Connally Campus, Waco, Texas.

Rueter,Bill, Professor, Technical Development Curriculum, Texas State Technical Institute, James Connally Campus, Waco, Texas.

Rushing, Joe B. (Dr.), Chancellor, Tarrant County Junior College, 1400 Fort Worth National Bank Building, Fort Worth, Texas 76102.

Russell, Scott, Dean of Technical-Vocational Education, Bee County College, Route 1, Beeville, Texas 78102.

Sands, Bill, Health Occupational Program Officer, Office of Education, Region VI, 1114 Commerce, Dallas, Texas 75202.

Scott, Jo, Texas State Technical Institute, Rolling Plains Campus, Sweetwater, Texas 79556.

Shipper, Kenneth E., Dean, School of Technical Arts, Lamar University, P.O. Box 10043, Beaumont, Texas 77710.

Sorrell, Billy D., Chairman, Data Processing Department, Kilgore College 1100 Broadway, Kilgore, Texas 75662.

Stence, Jesse W., Associate Professor, Texas State Technical Institute, James Connally Campus, Waco, Texas 76705.

Stokes, Vernon L. (Dr.), Assistant Professor of Drafting, Tarrant County Junior College, South Campus, 5301 Campus Drive, Fort Worth, Texas.

Styles, Jimmie C., Vice Chancellor for Research and Development, Tarrant County Junior College, 1400 Fort Worth National Bank Building, Fort Worth, Texas 76102.

Taafe, Thomas J., Department Chairman and Associate Professor of Physical Science, Tarrant County Junior College, South Campus, 5301 Campus Drive, Fort Worth, Texas 76119.

Tate, Willie L., Director of Adult Education and Evening Division, Galveston College, 4015 Avenue Q, Galveston, Texas 77550.

Taylor, Meril, Department Chairman, Refrigeration and Air-Conditioning Technology, Tarrant County Junior College, South Campus, 5301 Campus Drive, Fort Worth, Texas 76119.

Tiner, Emmett L., Program Officer-MDT, Department of Health, Education and Welfare, Office of Education, 1114 Commerce, Dallas, Texas.

Tompkins, Jack E. (Dr.), Vice President, Texas State Technical Institute, James Connally Campus, Waco, Texas 76705.

Townsend, Robert N., Associate Dean of Occupational/Technical Division, Alvin Junior College, 3110 Mustang Road, Alvin, Texas 77511.

Turner, Verdell, Director of Admissions, Texas State Technical Institute, Mid-Continent Campus, Amarillo, Texas.

Vail, Harold W., Technical-Vocational Director, Hill Junior College, P.O. Box 619, Hillsboro, Texas 76645.

Wagner, Robert W., Vocational Teacher Educator, Texas A&M University, F.E. Drawer K, Engineering Extension Service, College Station, Texas 77843.

Wallace, Norman E., Associate Dean of Technical-Vocational Education, Amarillo College, 24th and Washington, Amarillo, Texas.

Walters, E. E., Assistant Dean of Applied Science, Del Mar College, 101 Baldwin Boulevard, Corpus Christi, Texas 78404.

Ward, Edwin L., Program Director, Texas Education Agency, 11th at Brazos, Austin, Texas 78711.

Whitlow, William N., Director of Guidance and Student Activities, Alvin Junior College, 3110 South Mustang Road, Alvin, Texas 77511.

Whitmore, Cheryl L., Assistant Professor of Mathematics, Texas State Technical Institute, James Connally Campus, Waco, Texas 76705.

Wickersham, Ben H., Director of Technical-Vocational Education, Angelina College, P.O. Box 1768, Lufkin, Texas 75901.

Williams, Everett L., Dean of Vocational Education, Amarillo College, Box 447, Amarillo, Texas 79105.

Williams, Frank P., Director of Occupational Education and Technology, St. Philip's College, 2111 Nevada Street, San Antonio, Texas 78203.

Williams, Jim, Intern, Tarrant County Junior College, 1400 Fort Worth National Bank Building, Fort Worth, Texas 76102.

Windebank, Edward A., Jr., Assistant Director of Continuing Education, Tarrant County Junior College, 1400 Fort Worth National Bank Building, Fort Worth, Texas 76102.

Wittrock, Marvin A., Chairman of Industrial Education Division, Houston Community College, 3830 Richmond, Houston, Texas 77027.

Woods, John C., Division Chairman of Business Administration and Data Processing, Tarrant County Junior College, Northeast Campus, 828 Harwood Road, Hurst, Texas 76053.

Word, Billy A., Instructor of Agriculture, Southwest Texas Junior College, Box 70, Uvalde, Texas 78801.

Wright, George B., Department of Electronic Technology, Alvin Junior College, 3110 South Mustang Road, Alvin, Texas 77511.

Wright, Jim (Honorable), U. S. Representative, Texas, Rayburn House Office Building, Washington, D.C. 20515.

Young, Robert J., Professor and Head, Texas State Technical Institute, James Connally Campus, Waco, Texas 76705.

Zatopek, Frank J., Director of Occupational Training, Kilgore College, 1100 Broadway, Kilgore, Texas 75662.

Zrubek, Jacqueline F., Assistant Professor, Texas State Technical Institute, James Connally Campus, Waco, Texas 76705

UTAH

Johnson, Howard M., Director of School of Technology, Weber State College, 3750 Harrison Boulevard, Ogden, Utah 84403.

Loveless, Austin (Dr.), Teacher Training, Utah State University, Logan, Utah.

Rogers, Galen E., Manager-Training Programs, Thiokol Chemical Corporation, P.O. Box 1388, Ogden, Utah 84016.

Shaw, G. Merrill, Head, Industrial Technology, Utah State University, Logan, Utah 84321.

Sorensen, Wilson, President, Utah Technical College at Provo, Box 1009, Provo, Utah 84601.

VIRGINIA

Ankeney, John V., Director, School of Engineering Technology, Virginia Commonwealth University, 901 West Franklin Street, Richmond, Virginia 23220.

Marley, William C., Curriculum Coordinator, Virginia Department of Community Colleges, P.O. Box 1558, Richmond, Virginia 23210.

Montague, Lawrence E., Coordinator of Special Training Division, Department of Community Colleges, 911 East Broad Street, Richmond, Virginia.

WASHINGTON, D.C.

Briggs, Lloyd D., Chief, Career Education Personnel Branch, U.S. Office of Education, 7th and D Street S.W., Washington, D.C. 20202.

Brooking, Walter J. (Dr.), Program Officer, Technical Education, Post-Secondary Programs Branch, U.S. Office of Education/DVTE, 7th and D Streets S.W., Room 5050 GSA/ROB3, Washington, D.C. 20202.

Foncannon, Howard F., Deputy Director of Education, AAAS, 1515 Massachusetts Avenue, N.W., Washington, D.C. 20005.

Worthington, Robert M. (Dr.), Assistant Commissioner, Adult, Vocational and Technical Education, U.S. Office of Education, Washington, D.C.

WASHINGTON

Jenkins, Hobart G., President, Spokane Community College, East 3403 Mission Avenue, Spokane, Washington 99202.

Schaer, Oliver K., State Director of T&I, Technical and Health Occupational Education, Coordinating Council for Occupational Education, 216 Old Capitol Building, Olympia, Washington 98504.

WISCONSIN

Birchler, Robert L., Technical Education Supervisor, District One Technical Institute, Eau Claire, WI, 620 W. Clairemont Avenue, Eau Claire, Wisconsin 54701.

Bordini, Dominic J., Deputy Director, Fox Valley Technical Institute, 1825 North Bluemound Drive, Appleton, Wisconsin 54911.

Carlson, Arthur P., Dean of Industrial and Technical Divisions, Milwaukee Area Technical College, 1015 North Sixth Street, Milwaukee, Wisconsin 53203.

Duffy, R. P. (Dr.), Administrator, S-W Wisconsin Vocational Technical School, 1170 Lincoln, Fennimore, Wisconsin.

Gibbons, Roger A., Division Chairman, Trades and Industry, Moraine Park Technical Institute, 805 East Johnson Street, Fond Du Lac, Wisconsin 54935.

Maiers, Merl J., Assistant Chairman of Trades and Industry Division, Madison Area Technical College, 211 North Carroll, Madison, Wisconsin 53703.

Mathison, Alfon T., Assistant District Director of Instruction, Milwaukee Area Technical College, 1015 N. Sixth Street, Milwaukee, Wisconsin.

Parkinson, George A. (Dr.), Director Emeritus (In Charge of Research and Long Range Planning), Milwaukee Area Technical College, 1015 North Sixth Street, Milwaukee, Wisconsin 53203.

Pokorny, Harry E., Associate Dean of Technical Division, Milwaukee Area Technical College, 1015 North Sixth Street, Milwaukee, Wisconsin 53203.

Potthast, Arnold H., Consultant of Technical Education, Wisconsin Board of Vocational-Technical, Adult Education, 137 East Wilson, Madison, Wisconsin.

Ramsey, William L. (Dr.), District Director, Milwaukee Area Technical College, 1015 North Sixth Street, Milwaukee, Wisconsin 53203.

Ruehl, Philip W. (Dr.), Assistant Dean, School of Industry and Technology, University of Wisconsin-Stout, Menomonie, Wisconsin 54751.

Scholl, Nic, T&I Coordinator-Program Planning, Southwest Wisconsin Vocational-Technical School, 1170 Lincoln, Fennimore, Wisconsin.

Schuff, Lee E., Instructional Media Specialist, Fox Valley Technical Institute, 1825 North Bluemound Drive, Appleton, Wisconsin 54911.

Spanbauer, Stanley J., Assistant Director-Instructional Services, Fox Valley Technical Institute, 1825 North Bluemound Drive, Appleton, Wisconsin 54911.

Taibl, Edwin J., Director, Milwaukee Campus, Milwaukee Area Technical College, 1015 North Sixth Street, Milwaukee, Wisconsin 53203.

Wisch, Clemens T., Assistant to the District Director, Milwaukee Area Technical College, 1015 North Sixth Street, Milwaukee, Wisconsin.

Wojciechowski, Arnold R., Instructor of Instrumentation, Milwaukee Area Technical College, 1015 North Sixth Street, Milwaukee, Wisconsin.

CANADA

Braun, Harold S. (Dr.), Dean of University Schools, Lakehead University, Thunder Bay, Ontario, Canada.

Fast Raymond G. (Dr.), Director of Instructional Services, Alberta Colleges Commission, 600 11160 Jasper Avenue, Edmonton, Alberta, Canada.

Shields, Donald A., Dean, Sheridan College, Trafalgar Road, Oakville, Ontario, Canada.

PUERTO RICO

Lopez, Marcelino, Supervisor of Technical Education, Technical Education Program Development of Education, Cesar Gonzales Street #33 Hatokey, San Juan, Puerto Rico.

Roca, Fernando, Coordinator, Technical Education, University of Puerto Rico, Rio Piedras, Puerto Rico.

Appendix G

PAST PRESIDENTS OF ATEA

1941-1944
WILLIAM PABST
205 Wetherill Road
Garden City, New York 11530

1944-1946
ANDREW D. ALTHOUSE
3175 Noble Road
Oxford, Michigan 48051

1947
EDWARD H. LANG
12858 Fremont Street
Yucaipa, California 92399

1948
WILLIAM N. FENNINGER
Box 31
Delmar, New York 12054

1949
WALTER J. E. SCHIEBEL
4619 Munger Avenue
Dallas, Texas 75204

1950
GEORGE H. PARKES
R.D. 1, Box 237
Linden, Pennsylvania 17744

1951
J. EVERETT HOLLINGSWORTH
Route 1, Box 907
Grass Valley, California 95945

1952
WALTER P. FERGUSON
Apt. No. 214
505 Cummer Street
Toronto, Ontario, Canada

1953
M. MARCUS KILEY
78 Mansfield Street
Springfield, Massachusetts 01108

1954
LEE W. RALSTON
2112 Linnington Avenue
Los Angeles, California 90025

1955
GEORGE W. MORGENROTH
65 Stocker Road
Essex Falls, New Jersey 07021

1956
CARL J. ANDERWALD, Supervisor
Div. of Occupational Ed. Supervision
New York State Education Dept.
Albany, New York 12224

1957-1959
BURR D. COE
Sharrer Road
R.F.D.
Port Murray, New Jersey 07865

1960-1961
J. WILLIAM MOROSI, Dean
Los Angeles Pierce College
6201 Winnetka Avenue
Woodland Hills, California 91364

1962
WALTER J. BARTZ, Coordinator
Post-Secondary Coordination Unit
405 Centennial Building
Springfield, Illinois 62706

1963
DONALD M. BRILL, Asst. Dir.
Wisconsin Board of Voc., Tech.,
and Adult Education
Madison, Wisconsin 53703

1964
EDWARD B. VAN DUSEN, Director
Evening Division
Lowell Technological Institute
Lowell, Massachusetts 01854

1965
IRA R. SANDERSON
729 Hillcrest Drive
London, Ontario, Canada

1966
THEODORE A. KOSCHLER, Vice President
Miami-Dade Junior College
11011 S.W. 104 Street
Miami, Florida 33156

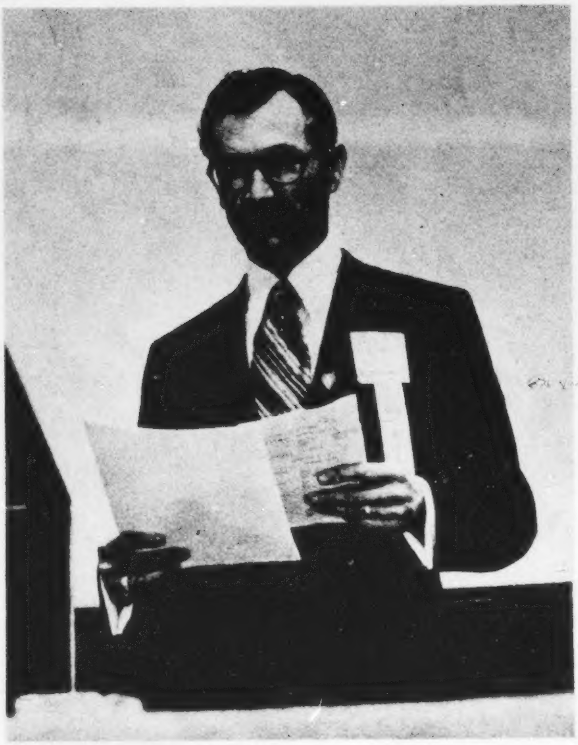
1967
MAURICE W. RONEY
Executive Vice President
Texas State Technical Institute
Waco, Texas 76705

1968
JERRY S. DOBROVOLNY, Head
Dept. of General Engineering
University of Illinois
Urbana, Illinois

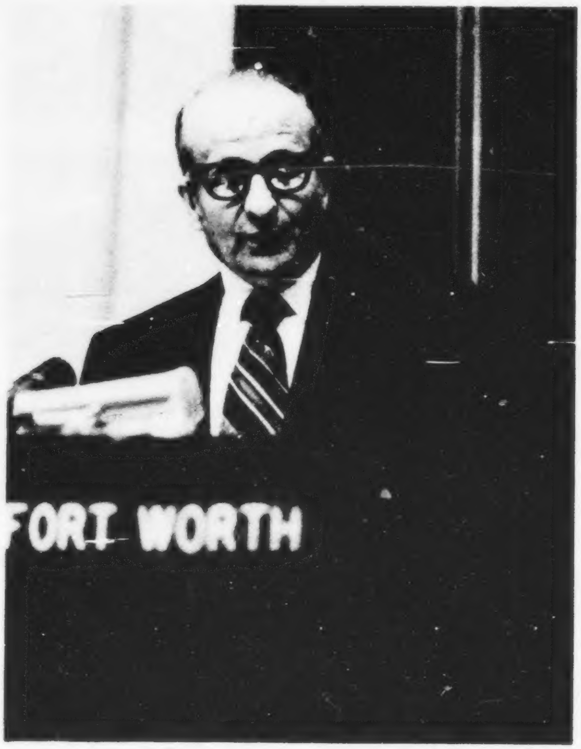
1969
ROY W. DUGGER
Texas State Technical Institute
Waco, Texas

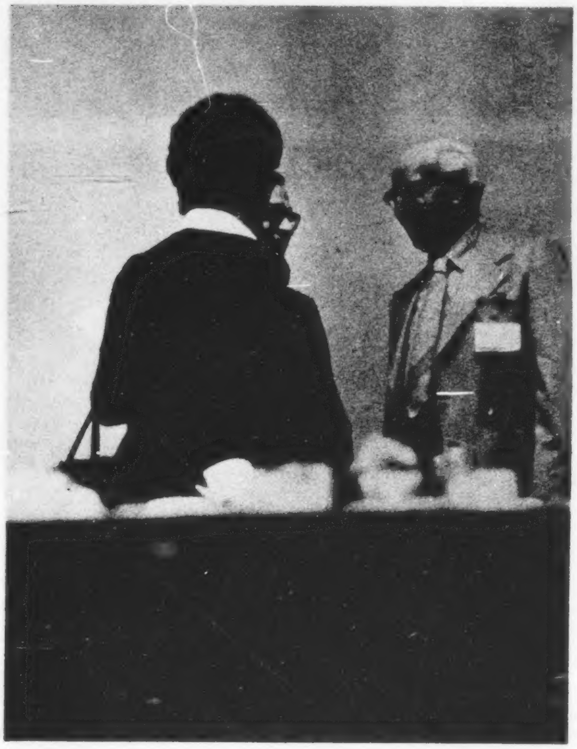
1970
LUCIAN LOMBARDI, Director
State Technical College
P.O. Box 2219
Hartford, Connecticut 06115

1971
RUTH E. MIDJAAS, Consultant
Vocational Education
Oaklans Schools
Pontiac, Michigan 48054



ATON FORT WORTH


FORT WORTH



SHERATON-FORT WORTH